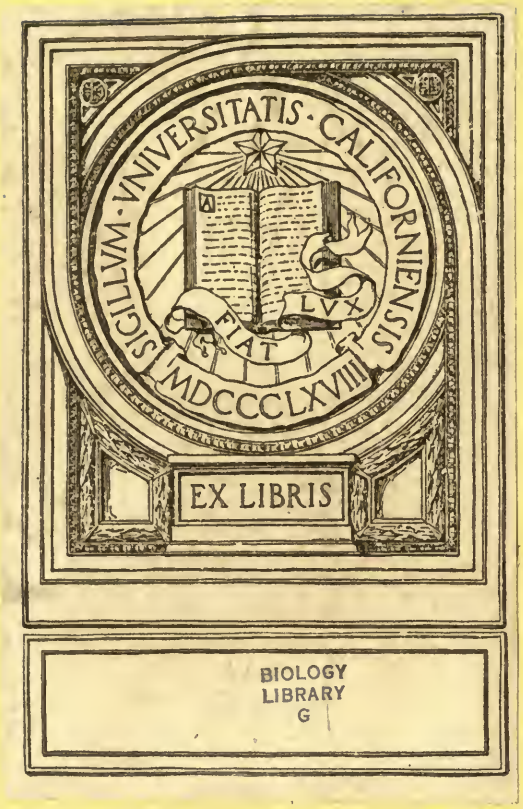

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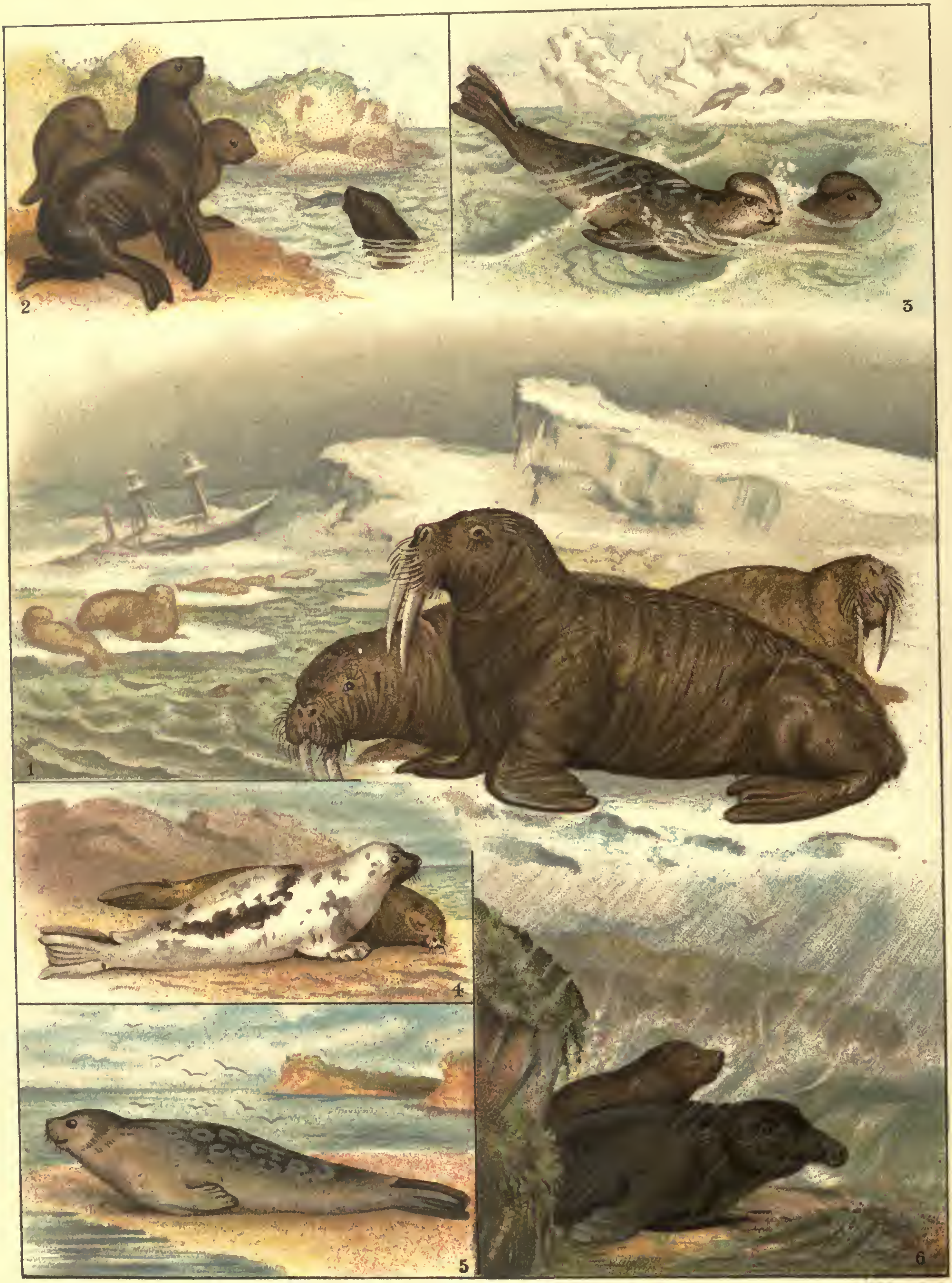

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WALRUS AND SEALS.

1. The Walrus, or Morse (*Trichechus rosmarus*).
2. The Sea Lion (*Otaria jubata*).
3. The Crested Seal (*Cystophora cristata*).
4. The Greenland Seal, or Saddle Back (*Phoca grœnlandica*).
5. The Ringed Seal (*Phoca fœtida*).
6. The Elephant Seal (*Macrorhinus elephantinus*).

CASSELL'S

NATURAL HISTORY.

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THE LAND CARNIVORA.

PROFESSOR W. KITCHEN PARKER, F.R.S., F.L.S., &c., AND PROFESSOR T. JEFFERY PARKER

THE AQUATIC OR MARINE CARNIVORA.

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HYRACOIDEA.

PROFESSOR WILLIAM BOYD DAWKINS, M.A., F.R.S., AND H. W. OAKLEY.

UNGULATA :—

- PERISSODACTYLA :
  - EQUIDÆ,
  - TAPIRIDÆ,
  - RHINOCEROTIDÆ,
- ARTIODACTYLA :
  - SUIDÆ,
  - HIPPOPOTAMIDÆ.

PROFESSOR WILLIAM BOYD DAWKINS, M.A., F.R.S., H. W. OAKLEY, AND
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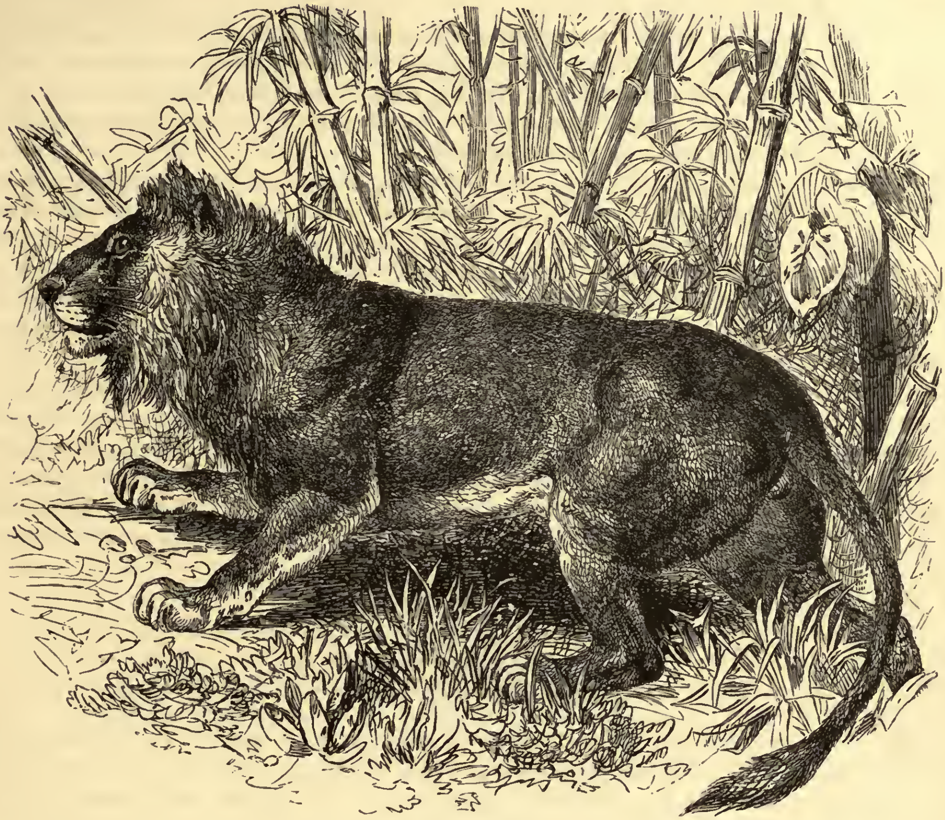
CASSELL'S NATURAL HISTORY.



LION OF GUZERAT.

THE CARNIVORA.

CHAPTER I.

INTRODUCTORY REMARKS—THE CAT FAMILY.

The Carnivora—Division into Terrestrial (Fissipedia) and Aquatic (Pinnipedia)—Introductory Remarks on the FISSIPEDIA—Their Relations to Man and to other Animals—Their Distribution over the Surface of the Globe—Their Structure—The Diversity of their Form and Habits—Their Division into Lesser Groups—THE CAT FAMILY—Their Geographical and Chronological Distribution—Their Skeleton—The Peculiarities of their Skull, Teeth, &c.

THE Carnivora, or flesh-eating Mammals, form a fourth order of the Mammalia, and are divided into two great groups, or sub-orders as they are called by zoologists, one terrestrial, and the other aquatic. The first is the group of the *Fissipedia*, or "split-feet," so called from the fact that the feet are divided into well-marked toes; the second is the group of the *Pinnipedia*, or "fin-feet" (Seals, &c.), so called from the fact that the toes are bound together by skin, forming fins or flippers rather than feet.

THE LAND CARNIVORA.*

This group, which comprises all the great "beasts of prey," is one of the most compact, as well as one of the most interesting among the Mammalia. So many of the animals contained in it have become "familiar in our mouths as household words," bearing as they do an important part in fable, in travel, and even in history: so many of them are of such wonderful beauty, so many of such terrible ferocity, that no one can fail to be interested in them, even apart from the fact likely to influence us more in their favour than any other—that the two home pets which of all others are the commonest and the most interesting belong to the group.

---

* *Fissipedia.*

No one who has had a Dog friend, no one who has watched the wonderful instance of maternal love afforded by a Cat with her kittens, no one who loves riding across country after a Fox, no lady with a taste for handsome furs, no boy who has read of Lion and Tiger hunts, and has longed to emulate the doughty deeds of the hunter, can fail to be interested in an assemblage which furnishes animals at once so useful, so beautiful, and so destructive.

It must not be supposed from the name of this group that all its members are exclusively flesh-eaters—and, indeed, it will be hardly necessary to warn the reader against falling into this mistake, as there are few people who have never given a Dog a biscuit, or a Bear a bun. Still, both the Dog and several kinds of Bears prefer flesh-meat when they can get it; but there are some Bears which live almost exclusively on fruit, and are therefore in strictness not carnivorous at all. The name must, however, be taken as a sort of general title for a certain set of animals which have certain characters in common, and which differ from all other animals in particular ways.

Comparatively few of the flesh-eaters are of direct use to man, at any rate while alive, yet one member of the group—the Dog—is the most useful of all domestic quadrupeds, though derived from one of the most savage of all—the Wolf. The Ferret, the Cheetah and the Cat are also more or less domesticated; but they come far below the Dog in amiable qualities, and in value to man. Below their value in service comes the use of their most beautiful skins; and still lower down the scent, derivable from a few species. Yet from these two last sources our fair ones seek to derive new charms, not heeding the poet Cowley's quaint objurgation:—

"The adorning thee with so much art
Is but a dangerous skill;
Like to the poisoning of a dart,
Too apt, before, to kill."

Most of the Carnivora may be looked upon as man's natural enemies, for he has no chance of making headway unless he can keep "the beast of the field" from "increasing upon him." Amongst primæval men, the tribes who made the best weapons to keep off these, the destroyers of their families, were certain to succeed best in the struggle for existence, so that the act of sharpening a flint-stone to repel the attack of some wild beast may be said to have prepared the way for civilisation, for flint knives led to bronze hatchets, bronze hatchets to axes and hammers of iron, and when once iron-working was understood and appreciated, civilisation went on with gigantic strides.

Besides acting as one of the severest of schoolmasters in the hard school of adversity in which man has been trained, the flesh-eaters serve to keep in check, and indirectly to bring to perfection, the grass-eating tribes. Upon these—the Oxen, Antelopes, Wild Asses, &c.—the large Carnivora delight to prey; in so doing they have to put forth all their powers, their agility, strength, and cunning, while the Herbivores, at the same time, have acquired caution and swiftness of foot in the highest degree, in order to escape from their ruthless and implacable destroyers.

While the larger beasts of prey keep in check the troops of great hoofed animals, the smaller kinds, such as Cats and Ferrets, have a most important office in thinning the constantly multiplying ranks of gnawing animals, such as Rats and Mice, which would otherwise prove a plague of the worst description. Indirectly, too, our Carnivora may even influence largely the spread of certain kinds of vegetation: for instance, as Mr. Darwin has shown, where there are no Cats there is no clover! This seems strange, not to say fabulous, but it is known that clover will only flourish when there are plenty of Humble-bees, the only insects able to carry the fertilising pollen from flower to flower, and so ensure a good supply of seed for the next crop. Now, Field Mice are particularly hostile to Humble-bees, knowing quite well where to find their nests and combs, and how to get at their honey, of which they are very fond. Thus, where Field Mice exist in great numbers, Humble-bees will be comparatively few. But Mice are chiefly kept down by Cats, and so the end of this biological "house that Jack built" is that to ensure a good crop of clover it is advisable to have plenty of Cats about!

The conception of the fearful struggle for existence going on between beast and beast has been caught by Shakspere in a wonderful passage in his "Timon of Athens." Apemantus would "give the world to the beasts to be rid of the men," whereupon Timon asks him whether he would have himself "fall in the confusion of men, and remain a beast with the beasts." Apemantus answers in the affirmative, and Timon's rejoinder is as follows: "A beastly ambition, which the gods grant thee to attain to! If thou wert the Lion, the Fox would beguile thee: if thou wert the Lamb, the Fox would eat thee: if thou wert the Fox, the Lion would suspect thee, when, peradventure, thou wert accused by the Ass: if thou wert the Ass, thy dulness would torment thee, and still thou livedst but as a breakfast to the Wolf: if thou wert the Wolf, thy greediness would afflict thee, and oft thou shouldst hazard thy life for thy dinner: wert thou the Unicorn, pride and wrath would confound thee, and make thine own self the conquest of thy fury: wert thou a Bear, thou wouldst be killed by the Horse: wert thou a Horse, thou wouldst be seized by the Leopard: wert thou a Leopard, thou wert german to the Lion, and the spots of thy kindred were jurors on thy life: all thy safety were remotion, and thy defence, absence." To learn the truth of these words, one has only to turn to any book of travel in Africa or India, where one is certain to read of a wholesale destruction which it is melancholy to think of.

In Great Britain this conflict is a thing of the past; but two terrible enemies of man even there have been extirpated within the historic period—namely, the Wolf and the Bear; of these and of their extirpation we shall speak when we come to describe those types. Now, happily, these greedy Carnivora are "scattered and peeled—meted out and trodden down." Far in the north of the island there is the wild Cat; the two Martens are becoming scarcer and scarcer; the Badger is found here and there; the Polecat is rare; so that the Fox, the Stoat, and the Weasel—the last being the very least and meanest of the order—alone are common.

But in the later geological epoch—pre-historic as to us—the nobler types abounded, and Great Britain was then as much the land of savage beasts as Africa and India are now.

The Carnivora are found all over the world, from the equator to the poles: in most parts of the globe they are abundant, the great exception being the Australian region of zoological geography, namely, the immense island of Australia, which can only boast of a Dog, doubtfully native, and New Zealand and the adjacent Polynesian Islands, which are quite devoid of members of the group, the native Dog of New Zealand having probably been recently introduced.

Many forms have become extinct, and, as we shall see when we come to speak of these bygone creatures, the lower we dig in the strata which compose the rocks of which our earth is made, the lower do the types become, that is to say, among the extinct Carnivora we have no animals so perfectly constructed for flesh-eating as the Cat family, for instance, but the various kinds get nearer and nearer, the lower we go, to what may be called the general plan of Mammalian structure, and farther and farther from the special type of structure found in the higher Carnivores of the present day.

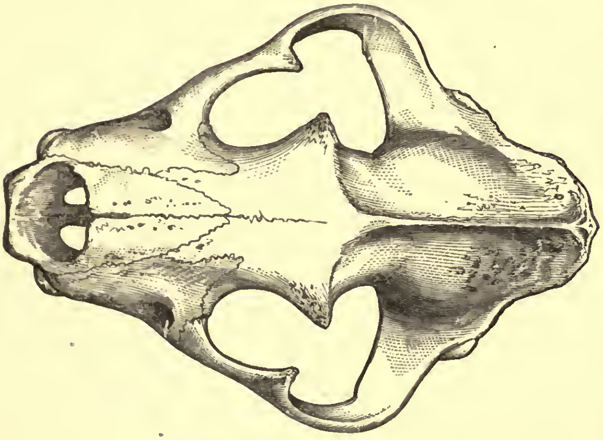
There is considerable range of size among the various members of the group, the Lion and Tiger being the largest, the Weasel and Suricate the smallest. As to their habits, the Carnivora are very varied; leaving out as we do for the present the fin-footed Seals, Sea Bears, and Walruses, we yet have the semi-aquatic Otter and the *Enhydra*, or Sea Otter, both at home in the watery element, and most expert swimmers and divers; but for the most part the flesh-eaters are inhabitants of the copse, the jungle, and the forest. Many are nimble climbers, some are arboreal in their habits, living entirely in trees, and most are crepuscular, that is, hunt their prey after dusk.

As to their diet, we mentioned above that they are by no means all flesh-eaters; in fact there is every gradation from those which live exclusively on animal food, such as the Lion, Tiger, &c., to the purely herbivorous kinds of Bear. Some again, such as the Cat family, seem to prefer flesh-meat, others, such as the Otter, adopt a Lenten diet, and feed on fish or eggs. This matter, however, is, of course, largely determined by the habitat of the animal, those whose habitation is inland being compelled to devour land animals, while those living by the sea or by river-banks usually take to fish either occasionally or as a regular thing.

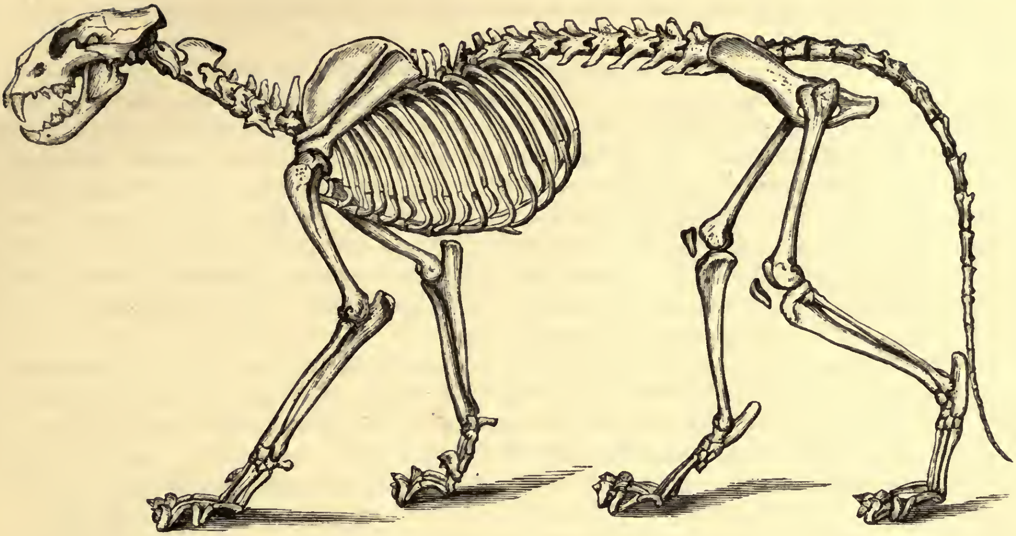
Turning to the structure of the group, one of the first things that strikes us is the looseness of their skin, which, instead of being stretched on the body as tightly as a drum parchment, as it is in grass-eaters—for instance, the Ox or Hippopotamus—is quite "baggy," having between it and the flesh of the beast a layer of the loosest possible fibres. It is for this reason that the skin of any but a *very* fat Dog can be pinched up so readily, while of a Herbivore it may be said, in the words of eulogy uttered by Mr. Squeers of his son Wackford, "Here's firmness, here's solidness! why you can hardly get up enough of him between your fingers and thumb to pinch him anywheres." In consequence of this the operation of skinning a Lion or Bear is a comparatively easy one. After the first cut the beast may be *pulled* out of his skin, almost without further use of the knife; while with an Antelope or an Ox the skin has to be *cut* away carefully and laboriously from the underlying flesh.

The use of this loose skin will be very evident to any one who will take the trouble to watch the great Cats playing together at the Zoological Gardens. They are continually scratching one another, but the loose skin is dragged round by the claws which, in consequence, can get no hold, and do no harm; with a tight skin, on the other hand, the slightest scratch of such a claw as a Tiger's would cause a serious wound. The looseness of the skin is very evident in the Puma and Jaguar, in which it hangs in a fold along the middle of the belly, like a great dewlap.

In the Carnivora the skeleton, or bony framework of the body, attains its utmost perfection, both as a *tissue* and as machinery. Its tissue is dense, white, and ivory-like, every bone is exquisitely moulded and polished, so that there are few more beautiful objects of study than a well-prepared Cat's skeleton, and almost none more instructive or better calculated to give an idea of the perfection of "animal mechanics." The flexibility and strength of the spine, the exquisite fitting of its joints, the small head capable of being turned in almost any direction in the search for prey or the avoidance of danger, the wonderful arrangement of levers afforded by the limbs, which exhibit at once the greatest amount of strength and the greatest amount of elasticity, all combine to fill the mind with wonder and admiration, as great as that excited by the most perfect work of art or the most stupendous phenomenon of inanimate nature.


UPPER VIEW OF LION'S SKULL.

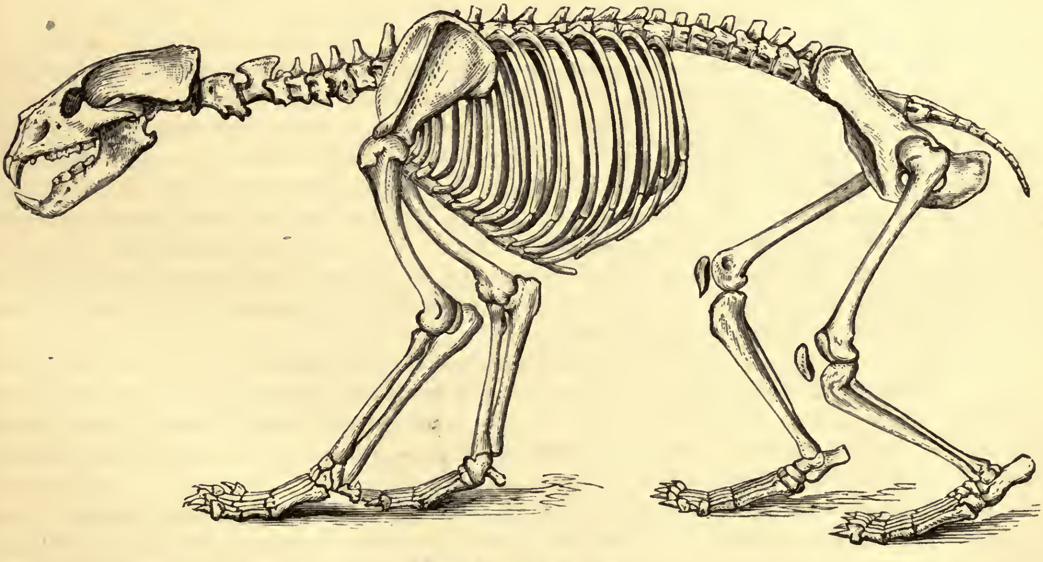
The skull of nearly all Carnivora is distinguished from that of most other Mammals by its immense strength, and its evident adaptation to the habits of its possessor—to the effective seizing and devouring of living prey. It is remarkable for the immense roughened bony ridges, developed in many parts of it, which serve for the attachment of the mighty jaw-muscles, the great size of which causes an increase in the width of the bony *jugal arch* extending from under the eye to just in front of the ear. Another point worthy of notice is the great shortening of the jaws, or of the *facial* in relation to the *cranial* portions of the skull. In this respect Carnivores, especially the most typical forms, the Cats, are very markedly distinguished from Herbivores, in which the brain-case is small and the face immensely prolonged. This has to do with the different kind of food used by the two groups—that of vegetable-eaters requiring long grinding, that of flesh-eaters powerful mincing. Connected also with this same function of mastication is the form of the *condyle,* or bony projection of the lower jaw, by which it moves on the skull, and of the smooth surface of the latter which receives it. These are in Carnivora greatly elongated transversely, and narrowed from before backwards, so that no motion from side to side, but only an up-and-down motion, is possible. The higher Carnivora, therefore, cannot *chew* or *grind* their food, but only *mince* it, their sharp teeth acting exactly like scissor-blades. In the interior of the skull should be noticed a large plate of bone which extends inwards and separates the great brain, or cerebrum, from the lesser brain, or cerebellum, and prevents the jarring of that important organ likely to arise from the animal's vigorous movements.



SKELETON OF LION.

In the spine, or vertebral column, there is not much to notice beyond the great size of the first two vertebræ, or those which support the head, and the development of strong spines or processes for the attachment of muscles.

In the limbs there are certain points of considerable interest and importance. If a Bear and a Lion be watched while walking, a great difference will be observed in their gait: the Bear's movements are far clumsier and less springy than those of the Lion. A little further observation will show that this is due, chiefly, to the manner in which their feet are set on the limbs, for it will be seen that the Bear keeps the sole of his foot flat on the ground, and, as his foot is very large, he has something of the awkward, sprawling movement of a man walking in shoes too big for him. The Lion, on the other hand, has his wrist and his heel lifted well above the ground, and so walks, not on the sole of his foot, but on his toes, the under surfaces of which are furnished with beautifully soft leathery pads, so as to ensure a soft, silent footstep. Then what looks like the knee of a Lion, Cat, or Dog is really his *wrist*,



SKELETON OF POLAR BEAR.

and what looks like a backward turned knee in his hind leg is his heel, the true elbow and knee being almost hidden by the skin.

The reason of this arrangement is seen by looking at the skeletons of the two animals. In the Bear the *metacarpals* and *metatarsals*, or five long bones extending between the wrist and the ankle respectively, and the joints of the toes, are kept in a horizontal position, as in ourselves; in the Lion, on the contrary, the metacarpals and metatarsals are lifted almost into a vertical position, the walking surface being now afforded by the under surface of the toe-bones, or phalanges. By reason of this the Lion gets an extra lever in his leg, in addition to the two levers which the Bear possesses, namely, those afforded by the bones of the arm and fore-arm and of the thigh and leg respectively; and consequently his springiness is greatly increased. An animal which walks like the Bear, on the sole of its foot, is said to be *plantigrade:* one which walks on its fingers, like the Lion, Cat, or Dog, is called *digitigrade.*

As in all animals in which the fore limbs are used for support, and not for prehension, the collar-bone, or clavicle, is either wholly absent or quite rudimentary, and the fore limb has therefore no bony connection with the trunk, but is attached simply by muscles and ligaments. The Carnivores, in leaping or running, often come down with their whole weight upon the fore legs, and if a large bony clavicle, like that of a Monkey or Bat, were present, it would infallibly be broken.

The bones are all strongly bound together by elastic bands, or *ligaments*, and are covered by the great fibrous masses, or *muscles*, which, forming as they do the flesh, take the chief share in giving to each animal its characteristic shape. These muscles are, in most instances, attached to the bones by strong cords or bands resembling the ligaments, and called *tendons*. The bones being, in great measure, articulated or jointed to one another by smooth surfaces, sometimes flat, sometimes round, sometimes pulley-like, act as levers. The muscles are usually attached at one end to a fixed at the other to a movable bone; when they act, by shortening in length and widening in diameter, they make the more movable bone to turn upon the other. In this way they cause the limbs to be straightened or bent, the jaws to be opened or shut, the claws extended or retracted, and perform all the other movements of which the animal is capable. The development of the muscles in the larger Carnivora is wonderfully great. A Lion will kill an Ox with a blow of his paw, and drag it off to his lair as easily as his humble relation, the Cat, disposes of a Rat or Mouse.

We now have to consider a most important series of organs—the organs of *alimentation* or *nutrition;* those, in fact, which serve the purposes of taking in, preparing, and digesting the food. They are the mouth with its tongue, teeth, and salivary glands, the gullet, stomach, and intestines, with the liver, and sweetbread, or pancreas.

We are all familiar in ourselves with *four* kinds of teeth, namely (1), the "incisors," or cutting teeth, in front; (2), the "canines," the pointed eye-teeth that come next; (3), the "false grinders," or "premolars;" and (4), the true grinders, or "molars." Man has a very even and full-mouthed series; the Carnivora, on the other hand, possess a most irregular series, and in this series there are certain gaps or interspaces. Our own even orderly set is best adapted for a mixed diet, that has for the most part undergone a great amount of change by cooking. But the Carnivora, in their wild state, must eat flesh raw, and for the most part reeking, and this has to be torn from the conquered prey. So that the teeth have to be applicable to the first, or destructive process, and then to the tearing to pieces of the fleshy substance, and the scraping of the bones; they may even have to crush the bones themselves, the more spongy parts serving for food; and, greatest feat of all, to break the hardest long bones for the succulent marrow.

The mode of feeding and the form and number of the teeth of necessity correspond: tearing and gnawing are processes that need teeth like knives and scissors, while grinding or chewing require teeth like millstones. Both these kinds exist in the Bear. In the Dog the crushing teeth become less in size and importance; in the Lion they are suppressed, and all the teeth have a cutting character, their number being at the same time much reduced.

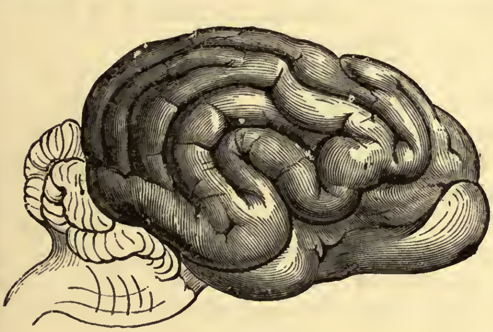
The teeth are often all that remains of certain extinct creatures; they are, therefore, a most important part of the anatomy of an animal, as well as being of great service in the matter of classification or grouping. They are the hardest of all the organs; their relation to the food of the species, and their necessary correlation to the digestive organs, makes them serve as a key to the rest of the creature's structure, which structure is in absolute harmony with its habits and daily life.

The tongue is covered with horny projections, or papillæ, and in the Cat tribe serves as a rasp to rub and scrape off the smaller fragments of flesh from the bones. The stomach is always simple, that is, consists of a bagpipe-like cavity not divided into compartments, as in the Ruminants and some other animals. A great difference from herbivorous animals is also seen in the length of the intestine. As the food is of a highly nourishing nature it requires less time for its digestion, and a smaller surface for its absorption into the blood, and the intestine is therefore remarkably short—not more than three times the length of the body in the Lion and Wild Cat, instead of being fifteen to thirty times the length, as in some vegetable feeders. The Carnivora have, therefore, the manifest advantage of a more compact and smaller "barrel" than the Herbivora, and, in consequence, have less weight to carry, and are slim and slender-waisted.

STOMACH OF LION.

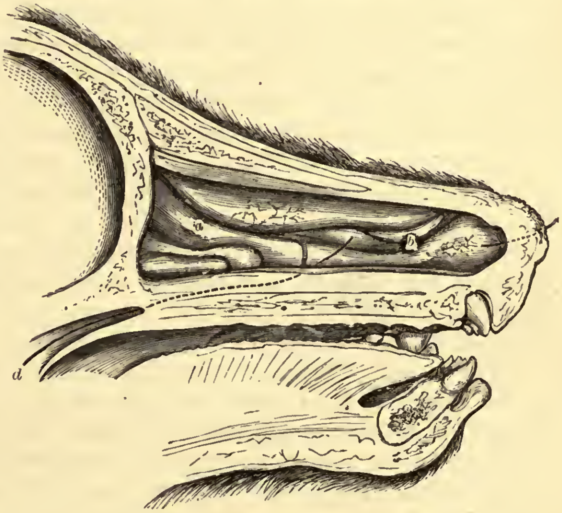
As might naturally be expected, the organs by which the blood, loaded with nourishment from the digestive canal, is carried to all parts of the body, are well developed. The heart, if not "as hard as the nether millstone," is yet compact and strong in the highest degree: the circulation is vigorous, and the result is seen in great courage and astonishing powers of endurance.

In the lungs, with the windpipe and larynx, in which the multitudinous cries of the group—barks, howls, roars, and whines—are produced, there is nothing to merit any special mention.



BRAIN OF DOG.

The brain of Carnivora is, as a rule, remarkably large and well formed, in conformity with their high degree of intelligence. Its surface is thrown into well-marked ridges with intervening depressions, and presents a great contrast with the almost smooth brain of a Shrew or a Hedgehog. From it are given off nerves to the tongue, teeth, skin, muscles, and other parts of the head, as well as some to organs at a considerable distance from the head, as the heart, lungs, and stomach, and, most important of all, three pairs of nerves, one for each of the organs of the higher senses—the nose, eye, and ear.



LONGITUDINAL SECTION THROUGH A DOG'S NOSE, SHOWING THE SPONGY BONES. (*Nat. Size. From a Sketch by T. J. Parker.*)

a. The smelling region; *b*. The sneezing region; *c*. A bristle passed through the nostril into the nasal chamber; *d*. A bristle passed from the nasal chamber into the passage by which the latter communicates with the mouth.

The two nerves of smell pass through a beautifully-perforated bone—hence called the "sieve-bone," or *ethmoid*—and proceed one on each side of a bony and gristly wall which divides the two nasal chambers from one another, to a delicate membrane covering a pair of bones of wonderful complexity—a labyrinth which must be seen to be understood, for the beautiful manner in which it enfolds itself can hardly be imagined. These "spongy-bones," as they are called, the membrane covering which forms the true organ of smell, lie in the upper and hinder part of each nasal cavity, but in front of them is a large scroll of bone, also covered by a membrane of exquisite sensitiveness, but not taking cognisance of odours. This anti-chamber, as it were, of the nose, is extremely sensitive, and its sensibility is a safeguard against intrusive dust, and deadly disease-germs. It is the *sneezing* region, and is the natural and most careful porter of the gates of the breath.

The way in which the eyes of the Carnivora are set in their head indicates their habits of life They look straight forward, and are expressive, in the nobler kinds, of the energy and cruelty of their owner's disposition. As in many of the Lemurs, the eye possesses what is called a *tapetum*, a sort of reflecting mirror in the bottom of the eye, which redoubles, as it were, the faint rays of evening, evidently a very important thing for these, mostly nocturnal, animals.

The sense of hearing is as perfect as that of sight; not, perhaps, in the higher, musical sense of the word, but for catching the faintest and feeblest undulations of the air. The Mole is supposed to be most sharp of hearing; but it is a question whether he is quicker of hearing than his cruel neighbour the Rabbit-killing Weasel. Any one who has watched a Cat sitting demurely by a Mouse-hole, or a Terrier on the look out for a Rat, will give these Carnivores credit for the most acute sense of sound. Anatomy corroborates what simple observation suggests, and the internal as well as external organs of hearing in the Carnivora are most exquisitely perfect.

Many members of the group live in families, that is, a male and female with their young form a little *coterie* by themselves, and associate very little with other families. Very few live in great societies or herds, after the manner of the grass-eating animals, such as Oxen, Antelopes, or Wild Horses, but an exception to this is afforded by the Wild Dogs of Constantinople, which roam the streets in great numbers, and by Wolves, which invariably hunt in packs.

The Dogs and Wolves, besides being gregarious, resemble the Herbivora in another and far less amiable characteristic, that is, they do not choose a mate for life or even for a season, but let their affections run wild and practise the most unmitigated polygamy and polyandry. Many of the larger Cats, on the contrary—the Lion, for instance—choose a mate, to whom they are wonderfully faithful.

The young are always born in a comparatively helpless condition, not able to run about at once like a new-born Calf or Foal; they are generally blind for some time after birth, and are entirely dependent on the mother for food and warmth.

The higher Carnivora are most kind parents, and to the best of their ability, *educate* their young. This was well known to the ancients: Ezekiel the prophet (xix. 2, 3) gives this character of the Lioness in inimitable language: "What is thy mother? A Lioness: she lay down among Lions, she nourished her whelps among young Lions. And she brought up one of her whelps: it became a young Lion, and it learned to catch the prey; it devoured men." All writers bear witness to the painstaking way in which the parent Lion or Tiger trains up its young and practises them for their trade of slaughter. Sometimes both parents, sometimes only one, go out with their offspring, and by example and precept show them the safest places to hide, the proper moment to spring, the best place to seize the victim, and so on. And the future tyrants are very apt, they thoroughly enjoy their schooling, and make the best possible use of their opportunities; so much so that the young of the great Cats are far more dreaded than the old ones, as they not only kill to satisfy hunger, but commit wholesale slaughter, simply for practice and to keep their paws in.

The diversity of form and structure in the group of land Carnivora is very great. We find, as in the groups we have considered previously, many different kinds or *species*, amongst which are creatures so different as the great and powerful Lion and the small and insignificant Weasel, the active Tiger and Jaguar, and the lazy Glutton. These species, as very little observation shows us, naturally fall into certain larger groups or *genera*, having important characteristics in common; for instance, the Lion, Tiger, Leopard, Jaguar, Lynx, and all the small Cats, are so much like one another, and so different from all other animals, as to be put in the one genus *Felis*, which is distinguished by having retractile claws, and by being quite devoid of true grinding teeth. Again, the Dog and Wolf have so many points in common, that they are placed in the single genus *Canis*, the Dog being called *Canis familiaris*, the Wolf *Canis lupus*. If a number of genera are found to agree pretty closely with one another in essential matters, they are grouped into a *family;* thus we have the family *Mustelidæ,* which includes not only the Weasel (*Mustela*), but a number of other genera, such as the Otter, Badger, Skunk, and many others. Furthermore, the families are conveniently grouped into *sub-orders,* according to characters considered to be of greater importance than those which determine genera or families. We may roughly compare this method of grouping to the way in which the soldiers in an army are arranged. Thus, individual men—corresponding to species—are arranged in *companies,* which we may take to represent genera; several companies are united into a *regiment,* just as a number of genera are united into a family; a greater or less number of regiments go to form a *battalion,* in the same way as the families go to form a sub-order; and, lastly, two or three battalions constitute an *army,* which is the complete assemblage, and corresponds, in our rough illustration, to an *order.*

We suppose that nine persons out of ten, if asked to give three common examples of land Carnivores, would, almost without hesitation, name the Cat, the Dog, and the Bear. The most accomplished naturalist would be unable to give a better answer to this question, as those three well-known animals are types of the three primary sections into which the whole sub-order is divided, and which may, in fact, be termed respectively the groups of the Cats, Dogs, and Bears. It must be borne in mind, however, that the words are here used in the broadest and most general sense, for the group of "Cats" includes not only the animals properly so-called, but also the Civets, Ichneumons, Hyænas, whilst amongst "Bears" are grouped Racoons, Otters, Badgers, Weasels, and many others.

It will, perhaps, be as well to give the scientific names for these three groups which we have, most unscientifically, called Cats, Dogs, and Bears. We have first the *Æluroidea,** or Cat-like animals; next the *Cynoidea,*† or Dog-like animals; and, lastly, the *Arctoidea,*‡ or Bear-like animals. We also give below a list of the families of land Carnivores arranged under their respective sections, with the most important forms belonging to each family; as such a list will, in all probability, be useful for reference.§

The splitting up of our flesh-eaters into these sections is not an arbitrary matter, but is determined by certain definite anatomical characters, one of the chief of which is the structure of the base of the skull. These matters will, however, be better discussed under the various families, when we shall also devote a short time to that very important branch of anatomy, the form, number, and arrangement of the teeth.

THE CAT FAMILY.||

This is the chief of the families of Carnivora, containing as it does all the great beasts of prey. Its members are the most perfectly constructed of animals for a life of rapine; their weapons—teeth and claws—attain the utmost degree of perfection, and their elegant form, silent movements, and often beautiful colouring, make them in every respect the culminating forms of the flesh-eating group, and one of the chief of the upper branches of the great Mammalian tree.

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* From the Greek, *αἴλουρος*, a Cat, and *εἶδος*, form. † From *κύων*, a Dog. ‡ From *ἄρκτος*, a Bear.

§ Section I.—ÆLUROIDEA (Cat-like animals).
  Family 1. *Felidæ* (the Cat family).
    Examples: Cat, Lion, Tiger, Leopard, Jaguar, Puma, Ocelot, Serval, Lynx, Cheetah, &c.
  Family 2. *Hyænidæ* (the Hyæna family), contains the Hyænas only.
  Family 3. *Cryptoproctidæ,* the Cryptoprocta only.
  Family 4. *Protelidæ,* the Aard-Wolf only.
  Family 5. *Viverridæ* (the Civet family).
    Examples: Civet, Genette, Ichneumon, Suricate, Binturong, &c.
Section II.—CYNOIDEA (Dog-like animals).
  Family 6. *Canidæ* (the Dog family).
    Examples: Dog, Wolf, Fox.
Section III.—ARCTOIDEA (Bear-like animals).
  Family 7. *Ursidæ* (the Bear family).
    Examples: The various kinds of Bear.
  Family 8. *Procyonidæ* (the Racoon family).
    Examples: Racoon, Coati, Kinkajou, Cacomixle.
  Family 9. *Ailuridæ,* contains the Panda only.
  Family 10. *Mustelidæ* (the Weasel family).
    Examples: Weasel, Stoat, Ferret, Badger, Skunk, Ratel, Glutton, Marten, Polecat, Otter.

|| *Felidæ.*

Both the Old and New World are well stocked with Cats. Everywhere they are the correlates, geographically speaking, of the beautiful forms of the Herbivora, and are their natural checkmates in the earth-peopling process. Their terrible office is to cull out the surplus number of Goats, Antelopes, Deer, Oxen, and Sheep; they also are not good neighbours to the Monkey tribes, nor to Rats, Cavies, Hares, Squirrels, and other gnawing animals. The smaller Cats also add feathered game to their diet. Everywhere they are the terror of woodland and of field, of plain and of forest. All are of the kindred of the Lion, and, like him, all "go about, seeking whom they may devour."

Man has half tamed one of the smallest—we say *half tamed*, for does not the demon that possesses all Cats still only slumber in the heart of the tamest domestic variety? As for the Hunting Leopard, he is deceived in the services he renders, and, in his own mind, is hunting for himself, and not for his master.

It is only necessary to mention the animals belonging to this noble family of "gentlemen caterers" to assure oneself that in it are contained the best known, the most skilled, the most perfectly armed of all the Carnivorous order. We have the Wild Cats existing under many forms nearly all over the world, the Lion the great tyrant of Africa, the Tiger the despot of India, the Puma and Jaguar taking their place in America, the Leopard helping the work of the Lion and Tiger in Africa and Asia, the Lynxes found in both Old and New Worlds, and the Cheetah, or Hunting Leopard of Asia and Africa. To these need only be added the Wolf, Hyæna, and Bear, to exhaust the list of "beasts of prey" in the ordinary acceptation of the term, that is, of beasts which are dangerous to man, for we "lords of creation" are not sufficiently generous to include under the term beasts of equal cruelty which prey on the lower animals.

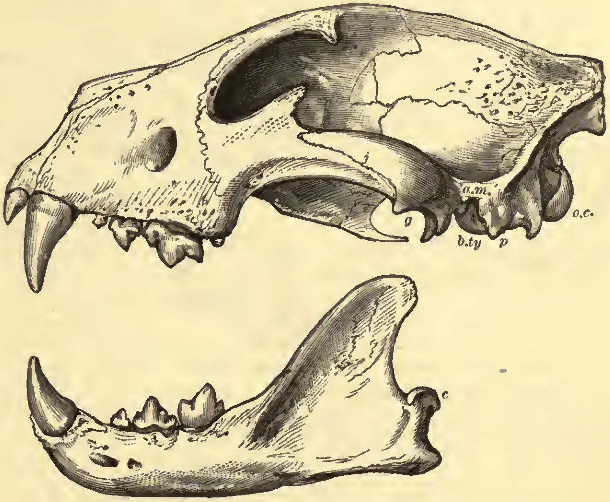
By most naturalists all these animals are grouped together under the single genus *Felis*, which is thus said to include a great number of species, as *Felis leo* (the Lion), *Felis tigris* (the Tiger), *Felis catus* (the wild Cat), &c. It is very usual to separate from the rest the Hunting Leopard, and make it constitute by itself a distinct genus, *Cynælurus*, or *Gueparda*, distinguished from its cousins by its great length of leg, and a slight difference in the form of its teeth. Some naturalists separate, in addition, the Lynxes, making of them the genus *Lyncus*, and others, again, prefer to make separate genera of all the chief kinds, calling the Lion *Leo nobilis*, the Tiger *Tigris regalis*, and so forth. This separation or union is, however, a mere conventional matter, and we prefer to consider all *Felidæ* as belonging to the one genus *Felis*, as the simplest and most comprehensible plan.

The *Felidæ* are found over almost the whole world, being absent only in Australia, New Zealand, the south-eastern part of the Malay Archipelago, the Polynesian Islands, Madagascar, and the Antilles. In all other parts of the world Cats—using the word in a wide sense—are found, and, wherever they are found they are feared, for such a compact assemblage of bloodthirsty tyrants and ruthless destroyers has no parallel in the whole animal kingdom.

Remains of fossil Felidæ have been found as far back as the Miocene or even the Eocene epoch, in the South of England, and Central and South Europe, in North-west India, in Nebraska, in North America, and in the caves of Brazil. Of these the best known is the great cave Lion or Tiger, the *Felis spelœa.*

Every part of these animals is so altered and specialised from the usual type of Mammalian structure as to assist in the best possible way the capturing, killing, and devouring of living prey. Looking merely at the outside, we are struck with the lithe, agile form, the small head, the total absence of anything like a "pot-belly," the well-proportioned limbs, the usually close fur, the stealthy, silent movements, and the eager, restless glance: all characters suited to an animal to which powers of quiet rapid movement through jungle or long grass, of quick observation, and of great strength and agility, are of the utmost importance.

In the skeleton there are two points of importance, as relating both to the habits of the Cat tribe and to the determining of their systematic position in zoology. These are the character of the skull, and the structure and arrangement of the bones of the toes. Both these points furnish characters by which the Cats may be separated from all other families. To these two points, therefore, we will proceed at once, as, without going into lesser details, there is nothing of special importance in the vertebral column, large limb bones, &c. All the points mentioned in the introduction to the group as being characteristic of the Carnivorous type of skull are here carried to their extreme. The bony ridges for the attachment of the jaw-muscles are immense; the jaws attain their utmost limit of structure and strength, and the lower jaw being perfectly incapable of motion from side to side, the teeth, as we shall see by-and-by, act like scissors and not like mill-stones.

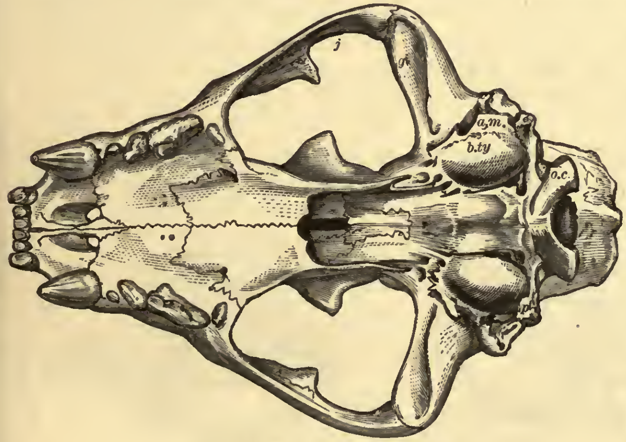


SIDE VIEW OF LION'S SKULL.

a.m, auditory meatus; *b.ty*, bulla tympani; *j*, jugal arch or zygoma; *o.c*, occipital condyle for the articulation of the skull with the first vertebra; *c*, condyle of the lower jaw; *g*, glenoid cavity with which the condyle of the lower jaw articulates: *p*, the bony clamp, or paroccipital process.

If the skull of a Cat be examined, there will be seen on its under surface, near the hinder end, a pair of rounded swellings, directed somewhat obliquely. On looking at the skull from the side, there is seen to be a roundish aperture, the auditory meatus, leading into each of these swellings, which are found to be thin-walled half globes, stuck on, as it were, to the under surface of the skull. Round the aperture is fixed, in the living state, the Cat's prominent external ear, and stretched across it, like the parchment of a drum, is a thin membrane, which vibrates with every sound. The rounded cavity is called the "drum of the ear," the membrane stretched across it the "drum membrane," or "tympanic membrane," and the bony half-globe, which forms the floor of the drum cavity, is the "bulb of the drum," or *bulla tympani.*

Closely pressed against the hinder wall of this bulla is a sort of bony clamp, which seems to keep the bulla in its place, and running obliquely along the surface of the swelling is an indistinct groove, corresponding to which, in the interior of the drum, is a bony wall, dividing the drum cavity into an inner and an outer compartment, these two divisions being formed from separate bones, as an examination of a very young skull will show.

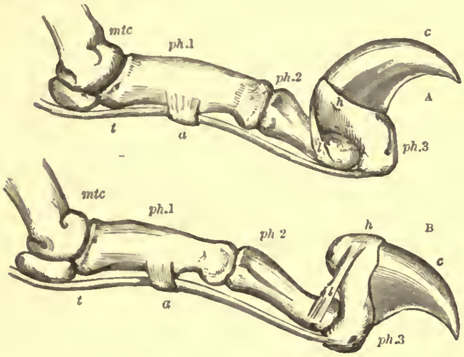


UNDER VIEW OF LION'S SKULL.

The letters have the same significance as in the side view.

The almost globular form and great relative size of the *bulla tympani;* the absence of any distinct bony passage leading from its cavity to the interior, the opening being quite flush with the wall of the drum; and the division of the cavity into two parts by a bony partition, are all very important as distinctive characters of the Cat family, and also, with lesser modifications, of the whole Æluroid group.

The power of retracting the claws, so characteristic a feature of all the true Cats (which are, without exception, digitigrade), is brought about by certain peculiarities of structure of the last two joints of the toes. Of the three *phalanges,* or bones which make up the skeleton of the toe, the first, or that nearest to the wrist or ankle, is of the ordinary shape: about three times as long as broad, with a regular cylindrical shaft, and pulley-like ends, for articulation with the bone to which it is joined. The second, or middle phalanx, is pretty much like the first, except that its shaft is scooped out on one side, so as to make a greater distance between it and the corresponding bone of the next toe than there would otherwise be. The third and last joint, called the *ungual phalanx*, from the fact of its supporting the claw, has the regular pulley-surface to articulate with the preceding joint, but its farther end is strongly curved downwards and pointed at the end; it has, in fact, the shape of the horny talon of which it forms the supporting core. Further support is afforded to the claw by an outgrowth of the phalanx, which commences near its articular end, and grows over the end of the claw like a sort of hood, thus giving the ungual phalanx of the Cat a most peculiar and unmistakable shape. Between the upper surfaces of the last phalanx and the last but one passes a strong and very elastic ligament, which so pulls upon the ungual phalanx as to bend it on its predecessor, and so cause the two to be almost parallel, the hood of the claw-bearing bone being received between the preceding joint of its own toe and that of the next; hence the scooping out of the middle phalanges. Thus, by the action of this ligament, the claw under ordinary circumstances is pulled back within its covering of skin, which forms for it a sort of protecting pouch, and effectually prevents its being worn down by rubbing against the ground. But when the Cat strikes its prey, it bends the paw upon the wrist by means of the strong *flexor* (or bending) muscles, which are placed along the under surface of the fore-arm and hand. The end of the string-like tendons of one of these muscles divides into four slips, one for each toe, and, running along the under surface of the first two phalanges, is inserted into the corresponding surface of the third, and, this under surface being bent upwards by the elastic ligament, the tendon is, when the claw is retracted, put upon the stretch. But when the flexors come into play, they pull upon the ungual phalanx, causing it to turn through a quarter-circle upon its articulation, and thus protruding the claw from its pouch. Immediately the flexors relax the elastic ligament is again allowed to act, and the claw springs back into its place of repose.



TENDONS AND LIGAMENTS OF A CAT'S TOE.

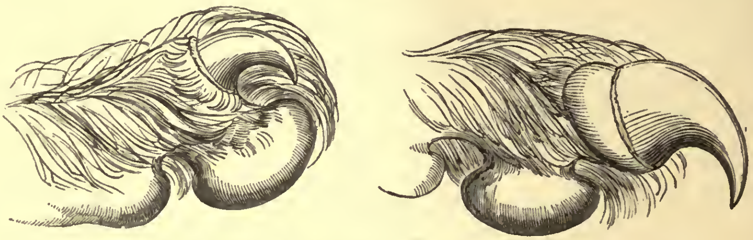
(*Twice Natural Size. From a Sketch by T. J. Parker.*)

A, with the claw retracted; B, with the claw exserted; *mtc*, the metacarpal; *ph.*1, the first; *ph.2*, the second; *ph.3*, the third phalanx; *h*, the bony "hood;" *c*, the claw; *l*, the elastic ligament; *t*, the flexor tendon; *a*, a ligamentous loop, through which the tendon passes.

This arrangement is of great importance, as the Cat family always attack their prey in the first instance by a stroke of the powerful fore-paw, and not, as do the Dogs, by a grip of the teeth.

Not less characteristic of the Cat family than the points we have just considered are the number and form of the teeth, which here attain the most perfectly carnivorous character, being so constructed as to be wholly incapable of grinding, thus making it impossible for their possessor to live upon any but highly nourishing animal food.

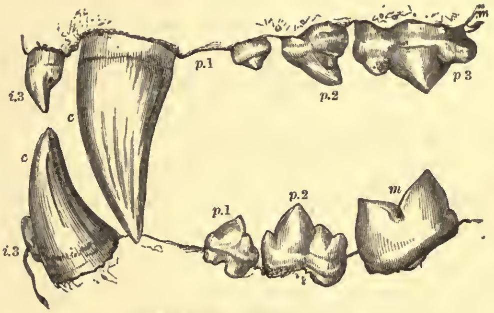
In the front part of the Cat's upper jaw are six small teeth with chisel-like edges—three on each side of the middle line. These teeth are, in shape, not unlike our own front teeth, and, like them, are single-fanged, but their small size, when compared with those that follow, is remarkable. They are borne by a bone quite distinct in young skulls from that which carries the other teeth—the premaxillary bone—and are, therefore, classed as *incisor* teeth. Corresponding with them in the lower jaw are six similar teeth—the lower incisors; so that the incisors of the Cat are said to be $\frac{3-3}{3-3}$, that is, three on each side above and below.



LION'S CLAW, SHEATHED AND UNSHEATHED.

Following the last incisor, and separated from it by a short interval, comes on each side in both jaws a long, pointed fang, the chief means by which the Cats seize and hold on to their prey. These are the *canines*, or dog-teeth, and correspond to the "eye-teeth" in ourselves, those adze-like teeth immediately following and slightly projecting beyond the last incisor. When the mouth is closed the lower canines are seen to bite in front of the upper, and to fit into the space between the latter and the incisors. The canines of the Cat are written thus, $\frac{1-1}{1-1}$.

Following the canines, but separated from them by a slight interval or *diastema*, are, in the upper jaw four, in the lower three teeth, which correspond to our "grinders," or molars and premolars. In the upper jaw the foremost tooth of this set is as small as one of the incisors, and its crown is simple, or nearly so. The next two teeth are larger and have sharp, cutting edges, divided into three points, or *cusps*. The second of these two teeth is much the larger, its edge is more blade-like, and the front part of its inner edge sends off a strong blunt process, which is supported by a distinct root, so that this tooth has three roots instead of two like its predecessor; it is also of much greater size than any of those in front, and, biting like a scissor-blade against the corresponding tooth of the lower jaw, is called the *sectorial*, or *carnassial* tooth. Behind it comes the last of the set, a small tooth with a transversely-set, almost flat crown.

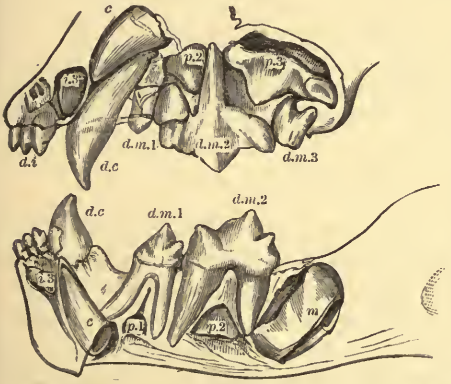


PERMANENT TEETH OF LION.

i. 3, the third incisor; c, the canine; *p.* 1, *p.* 2, *p.* 3, the premolars: *m*, the molars.

In the lower jaw, the grinding series is represented by only three teeth, all more or less resembling the second of the series in the upper jaw. Of these the third is the largest, and is called the lower carnassial, biting, as it does, against the upper tooth of that name. In every case the teeth of the lower jaw bite *within* those of the upper, and, the jaws being so articulated as to allow only of up and down motion, and being incapable of play from side to side, the molars and premolars entirely lose their character of grinders, and become trenchant, cutting up the food, in fact, in precisely the same manner as a pair of scissors.

Now comes the question, which of these teeth are premolars, and which molars? This is decided by finding which of them have their place occupied in the young kitten by its first set of back-teeth, the *deciduous* or *milk molars*, and which, on the other hand, have no predecessors: those which replace the milk-molars being the premolars of the adult, those which arise as altogether new teeth, and have no representatives in the young animal, molars. The examination of a young Cat shows that there are, behind the canines, in the upper jaw three, and in the lower two teeth; that is to say, one less on each side of each jaw than in the adult. As age advances these deciduous or milk molars all drop out, and are replaced by the permanent premolars, while behind the last milk molar of each jaw an entirely new tooth makes its appearance—the true or permanent molar. Thus it is seen that only the last tooth in each jaw is a molar, and that the carnassials are of different natures in the two jaws, the upper being the last (third) premolar, the lower the single molar.



MILK TEETH OF LION, EXPOSED BY CUTTING AWAY THE OUTER PORTIONS OF BOTH JAWS.

(*Natural Size. From Owen, after Rousseau.*)

di, deciduous incisors; *dc*, deciduous canines; *dm.* 1, *dm.* 2, *dm.* 3, deciduous molars. The remaining letters have the same significance as in the preceding figure.

We therefore write the premolars of the Cat $\frac{3-3}{2-2}$, and the molars $\frac{1-1}{1-1}$, so that the whole "dental formula" is as follows:—*i.*, $\frac{3-3}{3-3}$, *c.*, $\frac{1-1}{1-1}$, *p.*, $\frac{3-3}{2-2}$, *m.*, $\frac{1-1}{1-1}=30$. In the milk dentition, the number of incisors and canines is the same as in the adult, and, as we have just stated, the molars are absent, so that the formula is *di.*, $\frac{3-3}{3-3}$, *dc.*, $\frac{1-1}{1-1}$, *dm.*, $\frac{3-3}{2-2}$, $= 26$, *di, dc, dm*, standing for deciduous incisors, canines, and molars.

The tongue in this family becomes an important adjunct to the teeth, almost losing its character as a delicate organ of taste. The little elevations or papillæ which beset the tongue in all animals—in ourselves for instance—are formed into strong horny spines set closely together like the teeth of a file, and, as may be seen any day at feeding-time at the Zoological Gardens, used to rasp the flesh from the bones as effectively as any file would do it. Most people must have noticed the different texture of a Cat's and a Dog's tongue. In the latter it is as smooth as in ourselves, in the former it has more of the texture of a piece of coarse sandpaper.

In some *Felidæ*, such as the Domestic Cats, the pupil, or small aperture in front of the eye which lets in light to the sensitive retina beyond, has the round shape it possesses in man, only in the dark, when it is dilated to receive every ray of light available. In the day, on the other hand, when more light is to be had than the animal requires, the pupil contracts to an ellipse, or in the strongest light to a mere line. This is not the case in the larger Cats, such as the Lion, Tiger, and Leopard, in which also the eyes themselves and the cavities in the skull for their reception are smaller, proportionally, than in the Domestic Cat.

Taking the structure of the Cat tribe, all in all, there is nothing whatever to make it the least difficult to suppose that they all sprang from one stock, and that size and colour, and every other point in which they now differ from each other, may have been brought about, through long periods of time, as the result of the influence of their surroundings. It is necessary to presume this, for classifiers from necessity lay hold on the most minute differences, for the sake of making proper specific distinctions, although these differences may be merely the outcome of some change of locality, warmer, or colder, drier, or moister, higher upon the hills, or lower down on the plains. Once developed, however, it becomes hereditary, and then a *variety* becomes a *race*, and a race solidifies into a *species*. Yet, the result once obtained, however it arose, the profit is great to us who are careful observers and enthusiastic admirers of the infinite fecundity of Nature.

CHAPTER II.

THE CAT FAMILY—THE LION.

THE LION—Its Geographical Distribution at the Present Day and in Ancient Times—Its Haunts—Varieties of the Lion—Distinction between the Lion and other Cats—Its Courage, Speed, and Strength—Its Roar—Its supposed Magnanimity—Its Habits—Man-eating—Occasional resort to Vegetable Diet—Love-making—The Lion-cubs and their Education—Old Age—Breeding in Captivity—Lion-hunting.

THE LION.*

THE "King of Beasts" must, of course, be placed at the head of our list of beasts of prey, for although he is excelled in size and ferocity by the Tiger, in elegance of form by the Leopard and Jaguar, and in beauty of colouring by most of the great Cats, yet it would be useless, even if it were advisable, to depose him from the throne he has, by the universal consent of mankind, so long occupied. And, truly, who would wish to uncrown him? He is anything but an amiable beast—cruel and cowardly, greedy, treacherous, noisy, and self-asserting, never forgetful of the "divine right of kings" to prey upon their subjects; but still he is quite on a level, in the matters of morality and fitness to reign, with a very large proportion of his brother sovereigns of the genus *Homo*, with whom he well deserves a place in that limbo where, according to the mildly-spiteful poet of Olney, dwell "all that ever reigned" of the kings of men.

The Lion is entirely confined to the Old World, where it ranges through Africa from Barbary to Cape Colony, and extends into the south-west corner of Asia, where its range just overlaps that of the Tiger. Except in this "debateable land" the two monarchs keep clear of one another, the Lion keeping court over Africa and South-west Asia, and the Tiger ruling in Southern and Eastern Asia, the most important pretender in either kingdom being the Leopard.

With respect to the subject of distribution of the Lion in ancient times, we will quote from a late able writer. "That Lions were once found in Europe there can be no doubt. Thus it is

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* *Felis leo.*

CALIFORNIA

LION OF THE CAPE.

recorded by Herodotus that the baggage camels of the army of Xerxes were attacked by Lions in the country of the Pæonians and Crestonœi, on their march from Acanthus (near the peninsula of Mount Athos) to Therme, afterwards Thessalonica (now Salonika). The camels alone, it is stated, were attacked, other beasts remaining untouched as well as men. The same historian also observes that the limits in Europe within which Lions were then found were the Nessus or Nestus, a Thracian river running to Abdera, and the Achelous, which waters Acarnania. Aristotle mentions Europe as abundant in Lions, and especially in that part which is between the Achelous and Nessus, apparently copying the statement of Herodotus. Pliny does the same, and adds that the Lions of Europe are stronger than those of Africa and Syria. Pausanias copies the same story as to the attack of the Lions on the Camels of Xerxes; and he states, moreover, that Lions often descended into the plains at the foot of Olympus, which separates Macedonia from Thessaly, and that Polydamas, a celebrated athlete, a contemporary of Darius Nothus, slew one of them, although he was unarmed. The passage in Oppian, which some have considered as indicating the existence of Lions up to the banks of the Danube, fails, as an authority, for placing the Lion in that locality, because, as Cuvier observes, the context shows plainly that the name of Ista is there applied to an Armenian river, either by an error of the author or of the transcribers."

Nor is Europe the only part of the world from which the form of the Lion has disappeared. Lions are no longer to be found in Egypt, Palestine, or Syria, where they were once evidently far from uncommon. The frequent allusion to the Lion in Scripture, and the various Hebrew terms there used to distinguish the different ages and the sex of the animal, prove a familiarity with the habits of the race. Even in Asia generally, with the exception of some countries between India and Persia, and some districts of Arabia, these magnificent beasts have become comparatively rare; and this is not to be wondered at. To say nothing of the immense draughts on the race for the Roman arena—and they were not inconsiderable, for there were a thousand Lions killed at Rome in the space of forty years—population and civilisation have gradually driven them within narrower limits, and their destruction has been rapidly worked in modern times since firearms have been used against them instead of the bow and the spear. The African Lion is annually retiring before the persecution of man farther and farther from the Cape. Mr. Bennett * says of the Lion: "His true country is Africa, in the vast and untrodden wilds of which, from the immense deserts of the North to the trackless forests of the South, he reigns supreme and uncontrolled." In the sandy deserts of Arabia, in some of the wild districts of Persia, and in the jungles of Guzerat, in India, he maintains a precarious footing; but from the classic soil of Greece, as well as from the whole of Asia Minor, both of which were once exposed to his ravages, he has been utterly dislodged and extirpated.

The fearful custom, so common afterwards among the Romans, of having many encaged Lions, "fierce with dark keeping," to use Bacon's expression, for judicial as well as sporting purposes, was evidently an old custom in the East; for we learn from the book of Daniel that the kings of Babylon kept a "den of Lions" into which offenders were thrown alive. Judging, however, from the Biblical narrative, the Chaldeans had a far less revolting manner of killing criminals than the Romans, for they seem to have used the Lions simply as executioners; to have cast in the victim, and then to have fastened up the entrance of the den, drawing a decent veil on the horrible scene taking place within. They did not, like the Romans, curry favour with the masses by making the death of their victims into a spectacle, at which all classes had their love of excitement gratified by the sight of men and women torn and mangled and devoured by raging beasts, to the accompaniment of small talk and flirtation.

As to the former occurrence of the Lion in places where it is now absent, we may instance its evident commonness in Palestine. One of the earliest Lion stories occurs in the history of the Hebrew Hercules, who, when travelling with his father and mother to Timnath, "came to the vineyards of Timnath: and, behold, a young Lion roared against him. And the Spirit of the Lord came mightily upon him, and he rent him as he would have rent a kid, and he had nothing in his hand: but he told not his father or his mother what he had done."†

Every one will remember David's account of his encounter with the tawny savage in the Syrian

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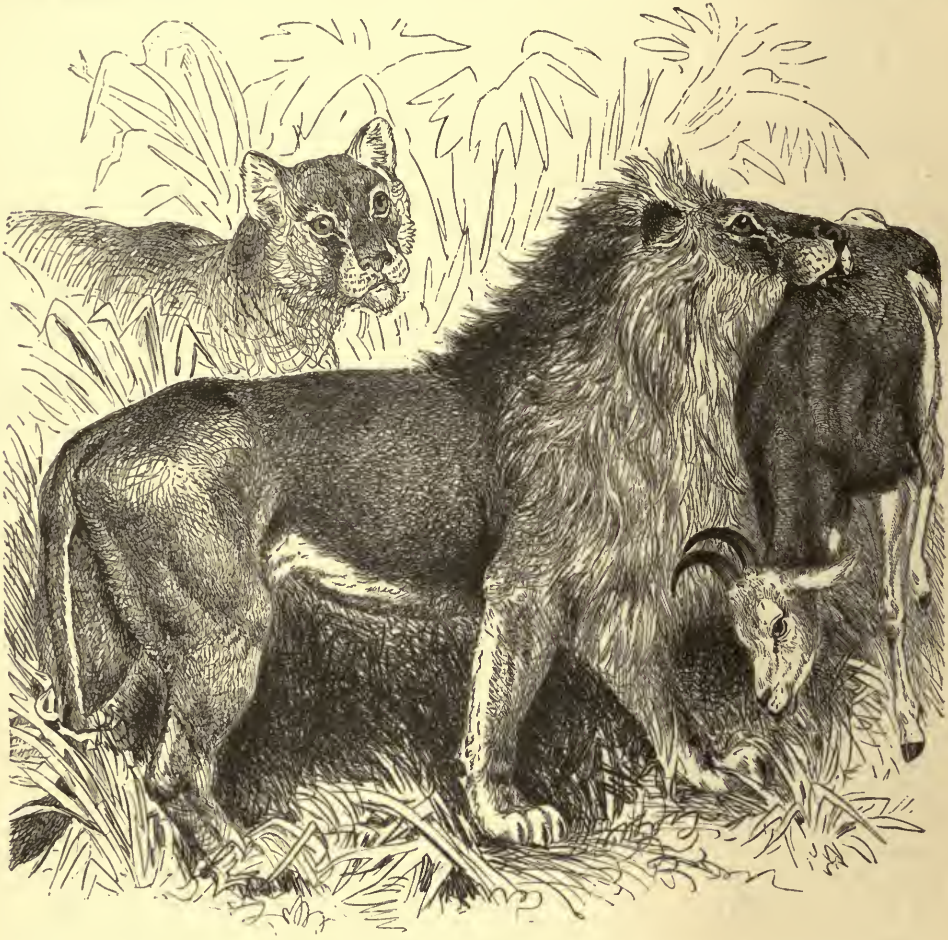
* "Tower Menagerie."

† Judges xiv. 5, 6.

pasture lands. "And David said unto Saul, Thy servant kept his father's sheep, and there came a Lion, and a Bear, and took a Lamb out of the flock: and I went out after him, and smote him, and delivered it out of his mouth: and when he arose against me, I caught him by his beard, and smote him, and slew him. Thy servant slew both the Lion and the Bear."*

Another Lion-slayer is one of David's "braves"—Benaiah—"He went down also and slew a Lion in the midst of a pit in time of snow."† Now this slight mention of the forest-king is a perfect picture in a few short words. In that land of milk and honey there was snow at certain seasons, and then that huge, bearded Cat was fain to hide himself in some cleft of the rock. If, however, the term "pit" means one in which the Lion has fallen, being entrapped, the short snatch of history loses none of its interest. The calm courage of this man made him to be "more honourable than the thirty mighty men," in the list of David's captains.



LION OF SENEGAL.

After the deportation of the ten tribes to Babylon, the number of Lions and other beasts of prey must have increased to a fearful extent in Palestine, for we find the men sent by the King of Assyria to re-people the deserted cities, complaining to their monarch of the ravages of these beasts which, as they put it, had been sent "because they knew not the manner of the God of the land."

As to the favourite haunts of the Lion in the various countries where it exists, "that Lions exist in the desert," says M. Carette, "is a myth popularised by the dreams of artists and poets, and has no foundation but in their imagination. This animal does not quit the mountains where it finds shelter, food, and drink. When the traveller questions the natives concerning these wild beasts, which Europeans suppose to be their companions in the desert, they reply, with imperturbable *sangfroid*, 'Have you, then, Lions in your country which can drink air and eat leaves? We fear only the viper, and, in humid spots, the innumerable swarms of mosquitos which abound there.'" * But the sacred writer makes him come up from the "swellings of Jordan;" and with Homer he is the Mountain Lion: the "artists and poets" of M. Carette are *moderns*, who know but little of the subject; not *ancients* who were familiar with the beast.

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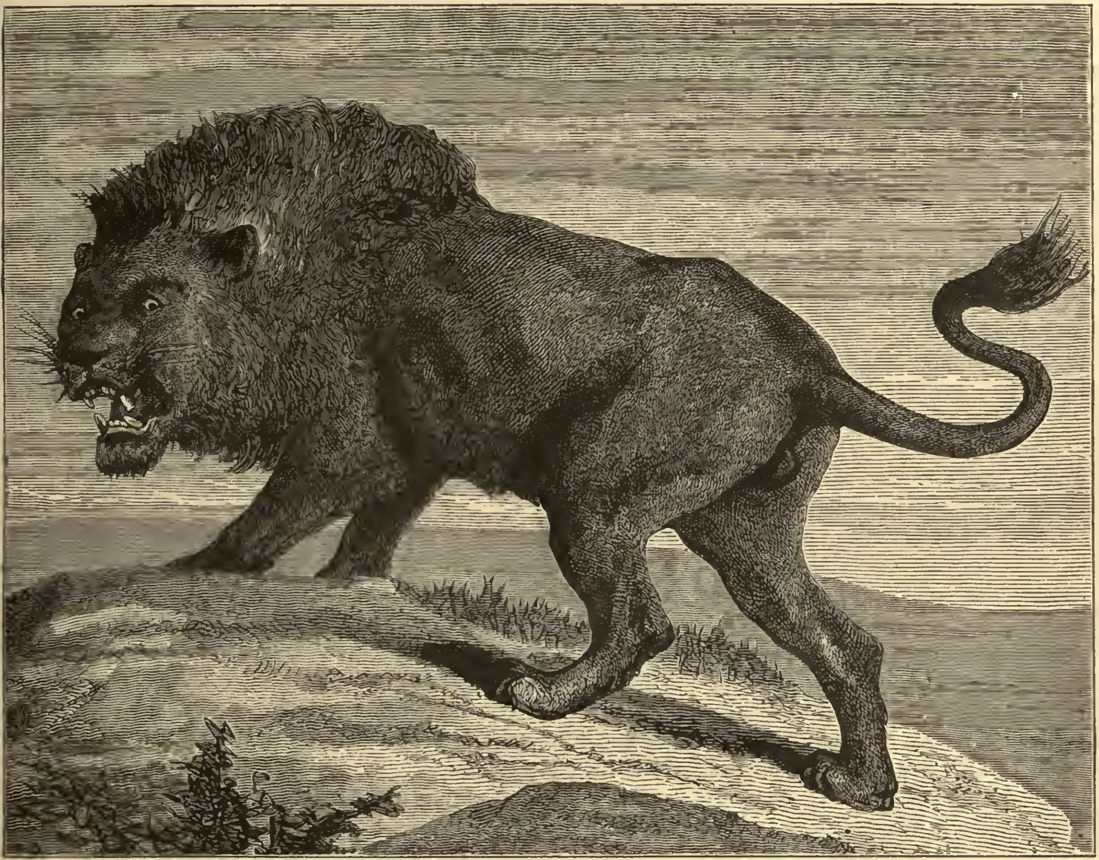
* 1 Samuel xvii. 34-36.

† 2 Samuel xxiii. 20.

When an animal has a wide geographical distribution it is almost always found that it exhibits, in different parts of its range, more or less well-marked varieties, distinguished from one another by evident though sometimes unimportant characters. This is the case with the Lion, of which five varieties are usually distinguished, three being found in Africa, and two in Asia. These varieties, or races, are as follows:—



LION OF BARBARY.

1. *The Lion of Barbary.*—The fur is of a deep yellowish-brown colour, and the mane is more developed than in any other variety, forming long tresses which cover the neck and shoulders, and are continued along the belly and the inside of the legs. This variety extends over the whole of Africa north of the Sahara.

2. *The Lion of Senegal* is found in the western part of Africa, south of the Sahara. Its fur is of a lighter colour than that of the Barbary Lion, and the mane is less thick, and hardly at all developed over the breast and insides of the legs.

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* Humboldt: "Views of Nature."

3. *The Lion of the Cape* ranges over the whole of South Africa, and is said to be found under two lesser varieties, one yellowish in colour, and the other brown: the latter is considered to be the more formidable. The mane is darker than in either of the foregoing kinds.

The Asiatic varieties are smaller than the kinds found in Africa. The mane is variable, and the form less graceful than in the Cape or Barbary Lion.

4. *The Persian or Arabian Lion.*—This is a paler variety found in Western Asia.

5. *The Lion of Guzerat*, or so-called "maneless Lion," is usually stated to be the best-marked variety of all, as its mane, though by no means absent, as the name of the variety would lead us to suppose, is very much less than in any other kind; the body also is bulkier and the legs shorter. Some writers, however, deny altogether the distinctness of the variety, and consider that the mistake of considering the Guzerat Lion as such, has arisen from the fact of young specimens having been described. The strongest statements we have met with on this head are by Captain Harris, whose words we will quote, as they show how little reliance is to be placed on the distinction drawn by travellers between closely-allied varieties or species. Harris says that the South African Lion does not differ "in any material points from those found in Guzerat, in Western India, measuring between ten and eleven feet in extreme length, but generally possessing a finer mane, a peculiarity which is attributable to the less jungly character of the country he infests, and to the more advanced age which he is supposed to attain. Amongst the Cape colonists it is a fashionable belief that there are two distinct species of the African Lion—the yellow and the black—and that the one is infinitely less ferocious than the other. But I need scarcely inform the well-instructed reader that both the colour and the size depend chiefly upon the animal's age; the development of the physical powers, and of the mane also, being principally influenced by a like contingency. That which has been designated the 'maneless Lion of Guzerat' is nothing more than a young Lion whose mane has not shot forth; and I give this opinion with less hesitation, having slain the 'king of beasts' in every stage from whelphood to imbecility."

There has been no attempt to divide the above-named varieties into distinct species. From Linnæus to Dr. Gray, all zoologists agree in this matter. Hence we see that animals do not vary under domestication only; but *wild* creatures also have their varieties or races, differing in the various localities in which they are found.

All these varieties together form a very well-marked species of the genus *Felis*, and are known as *Felis leo*, in zoological language. Some authors, however, as we have already noticed, prefer to consider the various kinds of Cat as so many distinct genera, and speak of the Lion as a single genus and species (*Leo nobilis*). The species, or genus—for it matters very little which we call it—is distinguished from other Cats by its uniform tawny colour, the tuft of hair at the end of the tail, and the flowing mane, which clothes the head, neck, and shoulders of the male. The head of the Lion is more square than that of the other species of Cats. The mane is entirely absent in the female, which is, in consequence, a comparatively ordinary-looking animal, as it is only by the grandeur of his hirsute appendage that the male is compensated for his plain colouring. The addition of the mane, however, gives him an immense advantage over all other species, adding to his apparent size, especially to that of the head, increasing almost infinitely the beauty of his form, and altogether making him one of the most magnificent objects in the animal kingdom. A further distinction between the Lion and other Cats is to be found in the strong tuft of hair at the end of the tail, which exists in both sexes. Quite at the extremity of the tail, and hidden by the tuft, is a curious little horny appendage or "thorn." with which it was supposed that the Lion, when lashing his tail, spurred his flanks, and so awoke all his courage and ferocity!

We have just mentioned the uniform tawny colour as characteristic of the Lion. This is so, in fact, in adult specimens, but the new-born young are invariably spotted, and the spots often persist for a considerable time. This is the case with Lions born in captivity, as well as with those in a state of nature, and has often been observed in the Lions born in the Zoological Gardens. In some instances the spots are visible during the animal's life. There are grounds for believing that all the great Cats are descended from a spotted ancestor.

One more external character: the snout of the Lion is longer and more Dog-like than that of any other Cat; the forehead and nose are almost in the same straight line, instead of making a bold curve, as they do in the Tiger, Leopard, Jaguar, and the smaller Cats. So that the Lion, which is conventionally represented with an almost human roundness of face, has really a more thoroughly quadrupedal " muzzle " than any of his kin.

In the Cape Lion the tail tuft is black, the mane brown or black, according to age, and the handsome appearance of the animal is thus much enhanced. There is also a black spot at each corner of the mouth.

The size varies slightly in the different varieties. Captain Harris gives the measurements of an adult male from the Cape as follows :—Extreme length from snout to tip of tail, usually about ten feet ; tail, three feet ; height at the shoulder, three feet eight inches. The " maneless " Lion is somewhat smaller, as shown by the following measurements made by Captain Smee :—Length, including the tail, eight feet nine inches and a half ; height (at the shoulder, we suppose), three feet six inches ; and the impression of his paw measured six inches and a half across. A female, killed at the same time, was eight feet seven inches long, and three feet four inches high. The weight of the male (excluding the entrails) was thirty-five stone.

The *real size* of the Lion is much less than would be supposed before measurement ; and he is very inferior in size to many kinds of the Herbivorous animals, such as Horses, Oxen, and Buffaloes, and even the larger Antelopes, such as the Eland.

As to the internal structure of the Lion, there is really nothing, or almost nothing, to add to what has already been said under the character of the whole family. Like all the great beasts of prey, the Tiger, Leopard, &c., the osseous and muscular systems are immensely developed. The ridges of the bones take on a marvellous size for the attachment of the muscles, and in the skull the size of the great processes to which the muscles of the neck are attached, and the width of the jugal arches, or bony bridges under which pass the great muscles by which the lower jaw is closed, and the powerful bite given, are very remarkable.

It is curious to see what wonderfully different impressions are produced on different writers by the appearance of the Lion in his native haunts. For instance, Captain Harris says, " Those who have seen the monarch of the forest in crippling captivity only, immured in a cage barely double his own length, with his sinews relaxed by confinement, have seen but the shadow of that animal which ' clears the desert with his rolling eye.' "

On the other hand, Livingstone speaks in the most disrespectful, not to say contemptuous way, of the animal's vaunted majesty of bearing : " When a Lion is met in the daytime, a circumstance by no means unfrequent to travellers in these parts, if pre-conceived notions do not lead them to expect something very ' noble ' or ' majestic,' they will see merely an animal somewhat larger than the biggest Dog they ever saw, and partaking very strongly of the canine features. The face is not much like the usual drawings of a Lion, the nose being prolonged like a Dog's ; not exactly such as our painters make it, though they might learn better at the Zoological Gardens ; their ideas of majesty being usually shown by making their Lions' faces like old women in nightcaps. When encountered in the daytime, the Lion stands a second or two gazing, then turns slowly round, and walks as slowly away for a dozen paces, looking over his shoulder ; then begins to trot, and, when he thinks himself out of sight, bounds off like a Greyhound."

The concluding sentence of this passage shows that Livingstone considers not only the Lion's beauty to have been over-rated, but his courage also. The following extract quite bears out this opinion :—

" On riding briskly along early one morning, I observed, as I thought, a solitary Zebra a few hundred yards in advance. I instantly alighted, and, leaving ' Spring ' (his horse) to take care ot himself, I made towards the quarry, gun in hand, under cover of a few small trees. Having proceeded for some distance, I peeped cautiously from behind a bush, when I found, to my astonishment, that the animal which I had taken for a Zebra was nothing less than a noble Lion. He was quietly gazing at me. I must confess I felt a little startled at the unexpected apparition ; but, recovering quickly from my surprise, I advanced to meet him. He, however, did not think fit to wait till I was within proper range, but turned tail, and fled towards the Swakess. Hoping to be able to come to close quarters with him, I followed at the top of my speed, and was rapidly gaining ground on the brute, when suddenly, with two or three immense bounds, he cleared an open space, and was the next moment hidden from view among the thick reeds that here lined the banks of the river. Having no

Dogs with me, all my efforts to dislodge him from his stronghold proved unavailing. Whilst still lingering about the place, I came upon the carcase of a Gnu, on which a troop of Lions had, apparently, been feasting not many minutes previously. Undoubtedly my somewhat dastardly friend had been one of the party."

After such rude shocks as these to our faith in the African monarch's courage, it is positively refreshing to come across instances where the Lion has shown himself capable of very great boldness, such, for instance, as the following :—

"We were waked up suddenly by hearing one of the Oxen bellowing and the Dogs barking. It was moderately dark, and I seized Clifton's double rifle, and rushed out, not knowing where, when I saw the driver perched on the top of a temporary hut, made of grass, about six feet high, roaring lustily for a doppè (cap). I scrambled up just as the poor Ox ceased his cries, and heard the Lions growling and roaring on the top of him, not more than fourteen yards from where we were, but it was too dark to see them. I fired, however, in the direction of the sound, and just above the body of the Ox, which I could distinguish tolerably well, as it was a black one. Diza (the driver) followed my example; and, as the Lions did not take the least notice, I fired my second barrel, and was just proceeding to load my own gun, which Jack had brought me, when I was aware, for a single instant only, that the Lion was coming; and the same moment I was knocked half-a-dozen somersaults backwards off the hut, the brute striking me in the chest with his head. I gathered myself up in a second, and made a dash at a fence just behind me, and scrambled through it, gun in hand, but the muzzle was

LION AND LIONESS ATTACKING AN ELEPHANT.

choked with dirt. I then made for the wagon, and got on the box, where I found all the Kaffirs, who could not get inside, sticking like Monkeys, and Diza perched on the top. How he got there seemed to me a miracle, as he was alongside me when the brute charged. A minute or two afterwards one of them marched off a Goat, one of five that were tethered by the foot to the hut that we had so speedily evacuated.

"Diza, thinking he had a chance, fired from the top of the wagon, and the recoil knocked him backwards on to the tent, which broke his fall. It was a must ludicrous sight altogether. After that we were utterly defeated, and the brutes were allowed to eat their meal unmolested, which they continued to do for some time, growling fiercely all the while. The Kaffirs said there were five in all. I fired once again, but without effect; and we all sat shivering with cold without any clothes on till near daybreak, when our enemies beat a retreat, and I was not sorry to turn in again between the blankets. I was just beginning to get warm again when I was aroused by a double shot, and rushed out on hearing that the driver and after-rider had shot the Lion. We went to the spot, and found a fine Lioness dead, with a bullet through the ribs from the after-rider; a good shot, as she was at least 150 yards off. Another had entered the neck just behind the head, and travelled all along the spine nearly to the root of the tail. I claimed the shot, and forthwith proceeded to skin her. I cut out the ball; it proved to be my shot out of Clifton's rifle. This accounted for her ferocious onslaught. The after-rider was rather chopfallen at having to give her up to the rightful owner.

"Diza got a claw in his thigh, and the gun which he had in his hand was frightfully scratched on the stock: rather sharp practice. A strong-nerved old Kaffir woman lay in the hut the whole time, without a door or anything whatever between her and the Lions, and kept as still as a Mouse all the while."

Again:—"The enemy disdainfully surveyed us for several minutes, daring us to approach with an air of conscious power and pride, which well beseemed his grizzled form. As the rifle balls struck the ground nearer and nearer at each discharge, his wrath, as indicated by his glistening eyes, increased roar, and impatient switching of the tail, was clearly getting the mastery over his prudence. Presently a shot broke his leg. Down he came upon the other three with reckless impetuosity, his tail straight out and whirling on its axis, his mane bristling on end, and his eyeballs flashing rage and vengeance. Unable, however, to overtake our Horses, he shortly retreated under a heavy fire, limping and discomfited to his stronghold. Again we bombarded him, and again exasperated he rushed into the plain with headlong fury, the blood now streaming from his open jaws, and dyeing his mane with crimson. It was a gallant charge, but it was to be his last. A well-directed shot arresting him in full career he pitched with violence upon his skull, and throwing a complete somersault, subsided amid a cloud of dust."

The Lion has some excuse for occasionally developing a strong running away propensity. His pace when going at full speed is wonderfully rapid, considering the length of his legs. As the following extract shows, he is able to outrun a firstrate Horse, so that the animals on which he usually feeds would, if he chose to pursue them, have simply no chance whatever against him. As we shall see, however, the Lion seldom pursues his prey, preferring to lie in ambush and to spring upon a passing herd. This consideration makes the following experience rather remarkable. The Lion probably pursued Mr. Baldwin not to satisfy appetite, but for revenge.

"Now for an adventure with a Lion, which I have reserved for the last. On Friday the old Masara captain paid me a visit. He had seen a Lion in the path, and left a lot of Masaras to watch him. I had been working hard all day in the hot sun with an adze, making a dissel-boom for the wagon, and was tired, lame, and shaky in the arms, and did not feel at all up to the mark for rifle-shooting; but I ordered 'Ferns' to be saddled, who was also not at all fresh, having had a tremendous burst in the morning across a flat after a lean Eland Cow. Just after, I caught sight of about twenty-five Masaras sitting down, all armed to the teeth with shields and assegais. My attention was attracted to a Kaffir skull, which struck me as a bad omen, and the thought entered my head that it might be my fate to lay mine to bleach there. I did not, however, suffer this thought to unnerve me, but proceeded, and found that the Lion had decamped. The Masaras followed his spoor about a couple of miles, when he broke cover. I did not see him at first, but gave chase in the direction in which the Masaras pointed, saw him, and followed for about 1,000 yards, as he had a long start, when he stood in a nasty thorn thicket. I dismounted at about sixty or seventy yards, and shot at him. I could only see his outline, and that very indistinctly, and he dropped so instantaneously that I thought I had shot him dead. I remounted and reloaded, and took a short circle, and stood up in my stirrup to catch a sight of him. His eyes glared so savagely, and he lay crouched in so natural a position, with his ears alone erect, the points black as night, that I saw in a moment I had missed him. I was then about eighty yards from him, and was weighing the chances of getting a shot at him from behind an immense ant-heap, about fifty yards nearer. I had just put the Horse in motion with that intention when on he came with a tremendous roar, and 'Ferns' whipped round like a top, and away at full speed. My Horse is a fast one, and has run down the Gemsbok, one of the fleetest Antelopes, but the way the Lion ran him in was terrific. In an instant I was at my best pace, leaning forward, rowels deep into my Horse's flanks, looking back over my left shoulder over a hard, flat, excellent galloping ground. On came the Lion, two strides to my one. I never saw anything like it, and never want to do so again. To turn in the saddle and shoot darted across my mind when he was within three strides of me, but on second thoughts I gave a violent jerk on the near rein, and a savage dig at the same time with the off-heel, armed with a desperate rowel, just in the nick of time, as the old manikin bounded by me, grazing my right shoulder with his, and all but unhorsing me, but I managed to right myself by clinging to the near stirrup-leather. He immediately slackened his speed. As soon as I could pull up, which was not all at once, as 'Ferns' had his mettle up, I jumped off, and made a very pretty and praiseworthy shot, considering the fierce ordeal I had just passed (though I say it who ought not), breaking his hind leg at 150 yards off, just at the edge of the thicket. Fearful of losing him, as the Masaras were still flying for bare life over the veldt, with their shields over their heads, and I knew nothing would prevail on them to take the spoor again, I was in the saddle, and chasing him like mad in an instant. His broken leg gave me great confidence, though he went hard on three legs; and I jumped off forty yards behind him, and gave him the second barrel—a good shot—just above the root of the tail, breaking his spine, when he lay under a bush roaring furiously, and I gave him two in the chest before he cried 'Enough!' He was an old manikin, fat and furious, having only four huge yellow blunt fangs left."

Not only has the Lion the advantage of great courage—at least, except when coming in contact with those he feels to be his masters—and of great swiftness, but his strength is prodigious. He will fell an Ox or an Antelope with a single blow of his paw, break its neck with one crunch of his cruel teeth, and bound off with it to his lair as easily as if he were only carrying a Rabbit. With a Calf in his mouth he has been known to leap a wall nine feet high. Not an animal of the forest, save the Rhinoceros, can hope to escape from such terrible perfections as these. Any quarry the Lion may choose—Ox, Antelope, or Zebra—is bound to succumb.

There is another characteristic about the beast which is a valuable accessory weapon, comparable to the "British cheer," with which our soldiers are always supposed to strike terror into the hearts of their enemies. We mean, of course, the terrible roar—that deafening thunder voice, at sound of which the Leopard and Hyæna hold their breath in awe, and the doomed flocks tremble and flee. With man even the noise, when heard for the first time, produces an indescribable feeling, and a firm conviction that all his courage will be needed to meet such a fearful opponent. Sometimes, however, the Lion seems to exercise his voice for fun, or for practice, rather than for striking terror into his hearers.

The terror in which the Lion is held by the meaner members of his own family is well shown by the following passage from Homer. Menelaus and Ajax hear Ulysses calling for help:—

"——— at the voice arrived, they found
Ulysses, Jove-beloved, compass'd about
By Trojans, as the Lynxes in the hills,
Athirst for blood, compass an antler'd Stag
Pierced by an archer; while the blood is warm
And his limbs pliable, from him he 'scapes;
But when the feather'd barb hath quell'd his force,
In some dark hollow of the mountain's side,
The hungry troop devour him; chance, the while,
Conducts a Lion thither, before whom

All vanish, and the Lion feeds alone;
So swarm'd the Trojan powers numerous and bold,
Around Ulysses, who with wary skill
Heroic combated his evil day.
But Ajax came, covered with his broad shield
That seemed a tower, and at Ulysses' side
Stood fast; then fled the Trojans wide-dispersed."

Shakspere has the same idea, when he says—

"Lions make Leopards tame."

The magnanimity of the Lion is a very well-worn theme. Every one knows all about Androcles and the Lion; "the tale is somewhat musty" by this time. All the older poets have something about it—the writers of the golden age—before natural selection was thought of, and when animals of many kinds were credited with a vast amount of idyllic amiability, of which, alas! nobody believes them capable now.

In the exquisite woodland scenery of "As You Like It," a hungry Lioness that has just suckled her whelps, is accredited with a nobility to which she, assuredly, had no title. "A green and gilded Snake" has been frightened from the sleeping Oliver by Orlando—

"——— it unlinked itself,
And with indented glides did slip away
Into a bush: under which bush's shade
A Lioness, with udders all drawn dry,
Lay couching, head on ground, with Cat-like watch,
When that the sleeping man should stir, for 'tis
The royal disposition of that beast
To prey on nothing that doth seem as dead."

We are not anxious to know when and how Shakspere gained his knowledge of wild beasts; we possess his descriptions, and that suffices for us. He may make Athenians speak like his fellow Englishmen; place Bohemia by the sea-side, and have the forest of Arden peopled with Lions. All that is of the least importance; for, may we not say of him, what he makes Helena say to Hermia?—

"——— your tongue's sweet air,
[Is] More tuneable than Lark to shepherd's ear,
When wheat is green, when hawthorn buds appear."

The Lion is a solitary animal, hunting alone, except from the commencement of the breeding season, when his wife goes with him, up to the time when the babies are beginning to know how to take care of themselves. Until they have arrived at months of discretion, "the Lion tears in pieces enough for his whelps and strangles for his Lionesses, and fills his holes with prey and his dens with ravine."

The Lion's den is made by scraping away the surface of the earth in some secluded spot, where the beast remains as long as game is plentiful, and there is no one to disturb him. When he has used up one hunting-ground, he departs for "fresh woods and pastures new."

He hunts entirely by night, at which time it is not safe for any one, in a Lion neighbourhood, to stir out without firearms, for the Lion, with the laziness which distinguishes him, will always prefer man-meat caught at once, to Antelope or Zebra-meat, for which he will have the trouble of looking. In the daytime he spends most of the time in sleeping off his bloody carouse, and, until nightfall, is always very unwilling to be disturbed, and unless molested hardly at all dangerous, except in the breeding season. This seems curious, as, from the ferocity of the animal when he is attacked, or when he is catering for himself by night, it savours of the marvellous to talk of such a savage being harmless under any circumstances. But there can be no doubt about the fact; he seems to object to expose his actions not only to the light of day, but also to that of the moon. For this, we have the testimony of a man whose loss Englishmen have not yet ceased to deplore; a man who, by universal consent, is *facile princeps* in the ranks of African explorers:—

"By day there is not, as a rule, the smallest danger of Lions which are not molested attacking man, nor even on a clear moonlight night, except they possess a breeding στοργή (natural affection). This makes them brave almost any danger. And, if a man happens to cross to the windward of them, both Lion and Lioness will rush at him, in the manner of a bitch with whelps. This does not often happen, as I only became aware of two or three instances of it. In one case a man, passing when the wind blew from him to the animals, was bitten before he could climb a tree. And, occasionally, a man on horseback has been caught by the leg under the same circumstances. So general, however, is the sense of security, on moonlight nights, that we seldom tied up our Oxen, but let them lie loose by the wagons. While, on a dark, rainy night, if a Lion is in the neighbourhood, he is almost sure to venture to kill an Ox."*

The following passage shows how unusual it is for a Lion to do any damage by day; so uncommon that the natives consider a supernatural cause necessary to account for so remarkable an occurrence:—

"The Bakàtla of the village Mabatsa were much troubled by Lions, which leaped into the cattle-pens by night, and destroyed their Cows. They even attacked the herds in open day. This was so unusual an occurrence that the people believed that they were bewitched: 'given,' as they said, 'into the power of the Lions by a neighbouring tribe.' They went once to attack the animals, but, being rather a cowardly people compared to Bechuanas in general, on such occasions, they returned without killing any."

The darker and stormier the night is the better the Lions like it, and the more persistent will be their attacks. "The new moon brought, if possible, a more abundant supply of rain than usual; nor did the Lions fail to take advantage of the nocturnal tempest, having twice endeavoured to effect an entrance into the cattle-fold. It continued, until nine o'clock the next morning, to pour with such violence, that we were unable to open the canvas curtains of the wagon. Peeping out, however, to ascertain if there was any prospect of its clearing up, we perceived three Lions squatted within a hundred yards, in open plain, attentively watching the Oxen. Our rifles were hastily seized, but the dampness of the atmosphere prevented their exploding. One after another, too, the Hottentots sprang out of the pack-wagons and snapped their guns at the unwelcome intruders, as they trotted sulkily away, and took up their position on a stony eminence at no great distance. Fresh caps and priming were applied, and a broadside was followed by the instantaneous demise of the largest, whose cranium was perforated by two bullets at the same instant. Swinging their tails over their backs, the survivors took warning by the fate of their companion, and dashed into the thicket with a roar."

When a Lion is fortunate enough to live in the neighbourhood of villages, he naturally prefers the least troublesome course of selecting his supper from the flocks and herds of the inhabitants. It is said that in Algeria, some thirty years ago, each Lion, in the course of his life, cost the Arabs upwards of £8,400, as he destroys every year Cattle, Horses, Camels, &c., to the value of £240, and the average duration of a Lion's life may be taken at thirty-five years. Thus, Jules Gérard, the celebrated Lion-killer, remarks, that in one district the Arab who paid five francs a-year to the State, paid fifty to the Lion!

If there are no farms or villages handy, the Lion has to content himself with the more troublesome course of catching wild prey. To this end he lies in ambush, in some convenient spot, and waits patiently or impatiently until a herd of Antelopes or Zebras passes by, when he leaps upon one of the number, roaring terribly. He usually strikes the animal down at once, by the immense weight of his body, the terrible blow of his paw, and the fearful grip of his teeth in the neck of his victim. If he misses his aim, he never pursues the flying herd, but returns dejectedly to his lair and waits for another opportunity. The Lion's mode of attack is described with all the marvellous accuracy and fire of his transcendent genius by the great Grecian:—

"———— as leaps a famish'd Lion fell
On beeves that graze some marshy meadow's breadth

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* Livingstone.

A countless herd, tended by one unskill'd
To cope with savage beasts in their defence,
Beside the foremost kine or with the last
He paces heedless, but the Lion, borne
Impetuous on the hindmost, one devours
And scatters all the rest."

" But as the Lion on the mountains bred,
Glorious in strength, when he hath seized the best
And fairest of the herd, with savage fangs
First breaks her neck, then laps the bloody paunch
Torn wide. Meantime, around him, but remote,
Dogs stand and swains clamouring, yet by fear
Repress'd, annoy him not or dare approach."

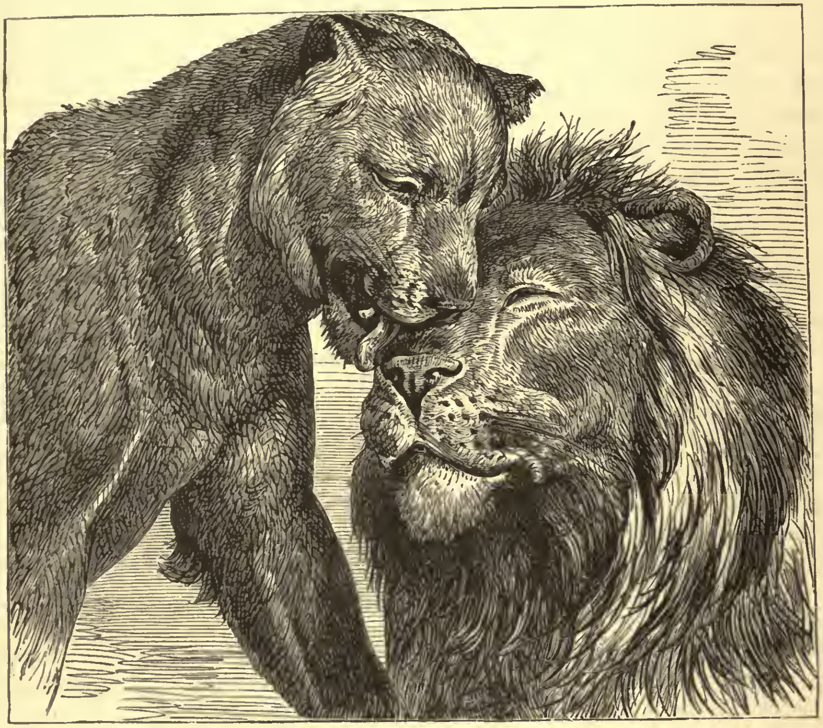
The Lion is said sometimes to develop the taste for "man-eating," which makes the Tiger so terrible. This, however, is comparatively rare, except in old animals; but, whether he eats men by choice or not his depredations are fearfully extensive, especially when he has had a good deal of experience, knows exactly when to attack a place, and has lost wholly or in part the fear of man, which usually distinguishes him. Here is an account of the termination of the career of one of these heroes, a perfect Dick Turpin among Lions, so great had become his skill in "lifting":—

"We had not been many days at that place, when a magnificent Lion suddenly appeared one night in the midst of a village. A small Dog that had incautiously approached the beast paid the penalty of its life for its daring. The next day a grand chase was got up, but the Lion, being on his guard, managed to elude his pursuers. The second day, however, he was killed by Messrs. Galton and Bam; and, on cutting him up, the poor Dog was found, still undigested, in his stomach, bitten into five pieces. The natives highly rejoiced at the successful termination of the hunt; for this Lion had proved himself to be one of the most daring and destructive ever known, having, in a short time, killed upwards of fifty Oxen, Cows, and Horses. When he had previously been chased he had always escaped unscathed, and every successive attack made upon him only served to increase his ferocity."

That the Lion does not always "drink the blood of the slain," but adopts a mild and cooling diet at times, is shown by a remarkable passage in Dr. Livingstone's work. He is speaking of the various vegetable blessings in the desert:—"But the most surprising plant of the desert is the 'Kengwe or Kéme' (*Cucumis caffer*), the water melon. In years when more than the usual quantity of rain falls, vast tracts of the country are literally covered with these melons. This was the case annually when the fall of rain was greater than it is now, and the Bakwains sent trading parties every year to the Lake. It happens commonly once every ten or eleven years. For the last three years its occurrence has coincided with an extraordinarily wet season. Then animals of every sort and name, including man, rejoice in the rich supply. The Elephant, true lord of the forest, revels in this fruit, and so do the different species of Rhinoceros, although naturally so diverse in their choice of pasture. The various kinds of Antelopes feed on them with equal avidity; and Lions, Hyænas, Jackals, and Mice, all seem to know and appreciate the common blessing."

This is a very curious circumstance when we consider how purely carnivorous the Lion, in common with the other *Felidæ*, is under ordinary circumstances. But Dr. Livingstone's is not the only evidence to show that the bloodthirsty creature occasionally likes a "relish" of green-meat with its flesh. We are informed by Dr. Huggins, F.R.S., that in the Zoological Gardens at Dublin a Lioness had had several litters, but the young ones invariably languished and died after a short time, until the expedient was hit upon of supplying the Lioness with live Goats. This seems horrible enough, but in fact it was not so. The Goat was put into the cage in the evening, and instead of manifesting the extreme terror one would have expected, it seemed to feel no fear at all, but ate grass placed in the den with perfect content, and, when night came, and it had eaten its fill, lay down by its terrible companion, cuddling up close to her, chewing the cud, and seeming to enjoy the warmth, and to be delighted with its new bedfellow. The Lioness showed no hostility to the confiding beast until towards the morning, when she suddenly smashed its head with one blow of her paw, ripped it open, and at once began feeding with avidity on the paunch, with its contents of softened and half-digested grass, always completely finishing this "herbaceous treat" before setting to work on the flesh. It is also stated (*vide infra*) that very old Lions take to eating grass, thus giving a literal significance to the favourite "Lion and Lamb" illustration, used by poets of all ages to express the change by which the "natural man" is converted into the "spiritual man," the savage civilised, and the "Philistine" cultured—"The Lion shall eat straw like the Ox."

> "And now beside thee, bleating Lamb,
> I can lie down and sleep,
> Or think on Him who bore thy name,
> Graze after thee and weep."



THE KISS OF PEACE.

The Lion enjoys the honourable distinction of being, unlike most Carnivora, strictly faithful to his spouse, although report says that she is by no means so virtuous, but only cleaves to her mate until a stronger and handsomer one turns up. Let us hope this is a calumny. At the breeding season each Lioness is usually followed by a number of Lions, who try all means in their power to gain her affections, and fight the most terrible battles with one another. In these fights the mane is of great use, for its length and thickness prevent the combatants taking a firm grip of one another's neck. Thus, the Lion with the finest mane has the best chance of succeeding in life in two ways. The Lioness is more likely to take a fancy to him than to a less favoured suitor, for most of the lower animals, as well as ourselves, appreciate personal adornment very strongly; and he has also the best possible protection in the tournament in which he is obliged to take part, fighting, *à outrance*, against all comers.

When the battle is over, and the "queen of love and beauty" has bestowed the prize—herself—on the victor, the happy pair live together until the young are able to take care of themselves. The male often hunts for his mate, and allows her to take as much as she wants of the prey before satisfying his own hunger. He cares for her in the same way all the time she is suckling, and for the litter from the time when they are weaned till they are able to hunt for themselves.

The Lioness goes with young about fifteen or sixteen weeks, and produces from two to six at a litter. The cubs are delightful little creatures, about as big as a moderate-sized Cat, blind at first, with pretty, innocent faces, and delightfully playful ways. The mother is devoted to them; thinks, no doubt, like Celia Chettam, in "Middlemarch," that where there are babies "things are right enough, and that error, in general, is a mere lack of that central posing force."

When the cubs are about eight to twelve months old they begin hunting for themselves, by attacking smaller animals, such as Sheep and Goats, under their parents' direction. The period between the ages of one and two years is the worst part of the Lion's existence, as far as the inhabitants of the district are concerned, for they " kill not only to support themselves, but also in order to learn how to kill."

At the age of three the young Lion's education is complete; he leaves his father's house, and begins to think of getting a house and a wife for himself, and then in her company he " roars after his prey and seeks his meat from God " for the rest of his career. He is not full-grown until the age of eight, when he may be considered as quite adult; and for many years to come revels in the consciousness of unconquerable strength and power, and oppresses all inferior creatures to his heart's content.

But even to king Leo " life is not all beer and skittles;" there is suffering and work to be borne and done. The lower creatures " groan and travail " with us; and we find disease where we should least expect to find it, namely, in the wild creatures that at their will freely roam the desert. "The Carnivora, too, become diseased and mangy. Lions become lean, and perish miserably by reason of the decay of the teeth. When a Lion becomes too old to catch game, he frequently takes to killing Goats in the villages. A woman or child happening to go out at night falls a prey too; and as this is his only source of subsistence now, he continues it. From this circumstance has arisen the idea that the Lion, when he has once tasted human flesh, loves it better than any other. A man-eater is, invariably, an old Lion. And, when he overcomes his fear of man so far as to come to villages for Goats, the people remark, 'His teeth are worn, he will soon kill men.' They at once acknowledge the necessity of instant action, and turn out to kill him. When living far away from population, or when, as is the case in some parts, he entertains a wholesome dread of the Bushmen and Bakalahari, as soon as either disease or old age overtakes him, he begins to catch Mice and other small Rodents, and even to eat grass. The natives, observing undigested vegetable matter in his droppings, follow up his trail in the certainty of finding him, scarcely able to move, under some tree, and despatch him without difficulty. The grass may have been eaten as medicine, as is observed in Dogs."

Before leaving the subject of the life and death of our great Carnivore, it will be as well to add a few words as to its breeding in captivity. It is stated by a naturalist who probably knows more about the matter than any other man,* that " the Lion appears to breed more freely than any other species of *Felis*, and the number of young at a birth is greater, not unfrequently four, and sometimes five, being produced in a litter. It is remarkable that these animals breed more freely in travelling collections (wild-beast shows) than in zoological gardens. Probably the constant excitement and irritation produced by moving from place to place, or change of air, may have considerable influence in the matter.

" A very extraordinary malformation, or defect, has frequently occurred among the Lions produced during the last thirty years, in the Regent's Park. This imperfection consists in the roof of the mouth being open. The palatal bones do not meet; the animal, is, therefore, unable to suck, and consequently always dies. This abnormal condition has not been confined to the young of any one pair of Lions, but many Lions that have died in the Zoological Gardens, and not in any way related to each other, have, from time to time, produced these malformed young, the cause of which appears to me quite unaccountable."

Lion-hunting has not yet become, like Tiger-hunting, a regularly organised sport, entered upon at a particular season by large parties of Europeans, who think far more of the fun of the thing than of ridding the world of destroying beasts. The sport of Lion-hunting, on the other hand, is only undertaken by an individual traveller, now and then, who has to take nearly the whole of the danger on his own shoulders, and is quite without the extraneous aids afforded by regiments of Elephant-mounted fellow-hunters, and armies of beaters. The rest of the Lion-killing is done, not for sport, but for use, to get rid of a beast which has decimated flocks, and put friends and neighbours to a cruel death. In all parts where the Lion is found, the natives have one or more ways of trying to get rid of him: sometimes meeting him in open fight, sometimes destroying him in a more underhand manner, by pitfalls, or the like.

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* Mr. Bartlett, the able Superintendent of the Zoological Gardens.

Of all methods, that which is attended with the least danger is the ditch, or pitfall, of the Arabs of Algeria. This is a pit four or five yards broad, and ten deep, dug in the middle of the *douar*, or small encampment of from ten to twenty tents, in which the Arabs live during the winter. The whole douar is surrounded by a hedge, two or three yards in height, and a lesser hedge is placed round the pit to prevent the cattle falling into it; the latter being kept loose within the encampment to attract Lions by their scent and their cries. When the desirable effect is attained, and a Lion has made up his mind to take toll from the flock he hears bleating within the enclosure, he leaps the hedge with one of his tremendous bounds, and, the ditch being a less distance from the hedge than the horizontal range of his leap, falls headlong into the trap prepared for him, from which, owing to its depth, and the fact that it is made narrower above than below, his most frantic efforts can never succeed in extricating him.

As soon as the Arabs hear his roars, and know that they have their enemy a prisoner, they prepare a great feast, summon all the inhabitants of the neighbouring douars, and, proceeding to the pit's mouth, every one hurls stones at the poor animal, calling him at the same time by all the opprobrious names in the Arabic vocabulary, and, finally, fire upon him until he is dead. When this is the case, they haul up the carcase with ropes; and, having got their prey on level ground, "the mothers take each a small piece of the animal's heart and give it to their male children to eat, in order to render them strong and courageous. They take away as much as possible of the mane in order to make amulets of it, which are supposed to have the same effect. Then, when the skin has been removed and the flesh divided, each family goes back to its respective douar, where, in the evening, beneath the tents, the event of the day will, for a long time, be the favourite story with every one."

Besides the pitfall, the Arabs construct ambushes, which are of two kinds. "In the first a hole is dug, about a yard deep, and three or four wide. After placing trunks of trees over it, and covering them with heavy stones, the whole is strewed over with the earth dug out of the ground, except in a few places on one side, where holes are left for the men to shoot through, and an opening on the other, which forms the door of the cavern, and which is closed from the inside by means of a piece of rock." A pit of this sort is made in some place frequented by Lions. The carcase of an animal is put on the ground opposite the loopholes, and the Arabs get inside and wait until the Lion begins to try conclusions with the bait, when he is promptly peppered by his hidden enemies.

In the second kind of ambush, the hunters conceal themselves in a tree instead of in a pit. Otherwise the mode of procedure is the same.

All these methods of Lion-slaying are safe and sure, but scarcely heroic. Often, however, the Arabs organise regular hunting parties, and compass the death of their foe in a far more legitimate and sportsman-like manner. A party of about fifty usually take part in the hunt; they proceed, after a good deal of talking over the plan of operations, to the Lion's lair, and by the footmarks it is determined whether the animal in question is young or old, male or female. Five or six experienced Arabs act as watchmen to observe the movements of the game, and signal to their comrades. The *modus operandi* varies with the age and sex of the Lion. Jules Gérard describes the method when a full-grown male, of course the worst of all to have to do with, is diagnosed.

"When the hunters have succeeded in getting within gunshot of the supposed lair, they 'turn' it, so as to command it from the high ground, and stop directly they command the position, observing throughout their operations the greatest silence. As the Lion's sense of hearing is very delicate, it sometimes happens that he hears the steps of the hunters, or the rolling of some stone which has been displaced from the side of the mountain. In this case he rises and walks in the direction of the sound. If one of the 'men of the watch' perceive him, he takes the skirt of his burnous in his right hand, and hoists it before him, which means 'I see him.' One of the huntsmen from the group then stands forward, and puts himself in communication with him, shaking his burnous from right to left, which signifies 'Where is he?' and 'What is he doing?' If the Lion is still, the 'man of the watch' raises the skirts of his burnous to his head, then lets them fall, and walks a few steps forwards, repeating the same signal, which may be translated by 'He is motionless, in front of you, and at some distance.' If the Lion walks to the right or left, the man walks in the same direction, shaking his burnous either from left to right, or from right to left. Finally, if the animal proceeds in the direction of the hunters, the 'man of the watch' places himself exactly opposite them, shakes his burnous violently, and cries with all his might, '*Aou likoum!*' ('Take care!') At this signal the hunters draw themselves up in a line, if possible against a rock, so that their position may not be turned. Woe to him who has not heard the cry of '*Aou likoum!*' in sufficient time, and has stopped at some distance from his comrades."

When a Lion actually comes in sight, all concealment is, of course, at an end. The Arabs get as near as possible, to fire, and as soon as their guns are discharged rush upon the wounded beast with their pistols and swords. As might naturally be expected the casualties in this mode of warfare are fearful; hardly a hunt takes place unmarked by the death of one or more of the hunters.

One of the most daring single combats of which we ever remember to have read was one between a great black-maned Lion and Mr. C. J. Andersson, who had all the real part of the fight entirely to himself. The account is also interesting as showing—like, perhaps, most descriptions of the same kind—how very tenacious of life the Lion is, for the animal in question, although it had received the contents of both Mr. Andersson's barrels, one of which completely smashed its shoulder, had a sufficient number of its nine lives left to enable it to get clear off, and cheat its gallant destroyer of his lawful spoil—the skin.

"One day, when eating my humble dinner, I was interrupted by the arrival of several natives, who, in breathless haste, related that an *Ongeama*, or Lion, had just killed one of their Goats close to the mission station (Richterfeldt), and begged of me to lend them a hand in destroying the beast. They had so often cried 'Wolf!' that I did not give much heed to their statements; but, as they persisted in their story, I at last determined to ascertain its truth. Having strapped to my waist a shooting-belt containing the several requisites of a hunter—such as bullets, caps, knife, &c.—I shouldered my trusty double-barrelled gun (after loading it with steel-pointed balls), and followed the men.

"In a short time we reached the spot where the Lion was believed to have taken refuge. This was in a dense tamarisk brake of some considerable extent, situated partially on and below the sloping banks of the Swakop, near to its junction with the Omutenna, one of its tributaries.

"On the rising ground above the brake in question were drawn up in battle array a number of Damaras and Namaquas, some armed with assegais, and a few with guns. Others of the party were in the brake itself, endeavouring to oust the Lion.

"But as it seemed to me that the 'beaters' were timid, and moreover somewhat slow in their movements, I called them back, and, accompanied by only one or two persons, as also a few worthless Dogs, entered the brake myself. It was rather a dangerous proceeding, for in places the cover was so thick and tangled as to oblige me to creep on my hands and knees, and the Lion in consequence might easily have pounced upon me without a moment's warning. At that time, however, I had not obtained any experimental knowledge of the old saying, 'A burnt child dreads the fire,' and therefore felt little or no apprehension.

"Thus I had proceeded for some time when suddenly, and within a few paces of where I stood, I heard a low, angry growl, which caused the Dogs, with hair erect in the manner of Hogs' bristles, and with their tails between their legs, to slink behind my heels. Immediately afterwards, a tremendous shout of 'Ongeama, Ongeama!' was raised by the natives on the bank above, followed by a discharge of firearms. Presently, however, all was still again, for the Lion, as I subsequently learnt, after showing himself on the outskirts of the brake, had retreated into it.

"Once more I attempted to dislodge the beast; but finding the enemy awaiting him in the more open country, he was very loth to leave his stronghold. Again, however, I succeeded in driving him to the edge of the brake, where, as in the first instance, he was received with a volley; but a broomstick would have been equally efficacious as a gun in the hands of these people, for, out of a great number of shots that were fired, not one seemed to have taken effect.

"Worn out at length by my exertions, and disgusted beyond measure at the way in which the natives bungled the affair, I left the tamarisk brake, and, rejoining them on the bank above, offered to change places with them. But my proposal, as I expected, was forthwith declined.

"As the day, however, was now fast drawing to a close, I determined to make one other effort to destroy the Lion, and should that prove unsuccessful, to give up the chase. Accordingly, accompanied by only a single native, I again entered the brake in question, which I examined for some time without seeing anything; but on arriving at that part of the cover we had at first searched, and when in a spot comparatively free from bushes, up suddenly sprang the beast within a few paces of me. It was a black-maned Lion, and one of the largest I ever remember to have encountered in Africa. But his movements were so rapid, so silent, and smooth withal, that it was not until he had partially entered the thick cover (at which time he might have been about thirty paces distant) that I could fire. On receiving the ball he wheeled short about, and with a terrific roar, bounded towards me. When within a few paces he crouched as if about to spring, having his head embedded, so to say, between his fore-paws.

"Drawing a large hunting-knife, and slipping it over the wrist of my right hand, I dropped on one knee, and, thus prepared, awaited his onset. It was an awful moment of suspense, and my situation was critical in the extreme. Still my presence of mind never for a moment forsook me—indeed, I felt that nothing but the most perfect coolness and absolute self-command would be of any avail.

"I would now have become the assailant; but as—owing to the intervening bushes, and clouds of dust raised by the Lion's lashing his tail against the ground—I was unable to see his head, while to aim at any other part would have been madness, I refrained from firing. Whilst intently watching his every motion, he suddenly bounded towards me; but whether it was owing to his not perceiving me—partially concealed as I was in the long grass—or to my instinctively throwing my body on one side, or to his mis-calculating the distance in making his last spring, he went clear over me, and alighted on the ground three or four paces beyond. Instantly, and without rising, I wheeled round on my knee, and discharged my second barrel, and as his broadside was then towards me, lodged a ball in his shoulder, which it completely smashed. On receiving my second fire he made another and more determined rush at me; but owing to his disabled state, I happily avoided him. It was, however, only by a hair's breadth, for he passed me within arm's length. He afterwards scrambled into the thick cover beyond, where, as night was then approaching, I did not deem it prudent to pursue him.

"At an early hour on the next morning, however, we followed his 'spoor,' and soon came to the spot where he had passed the night. The sand here was one patch of blood, and the bushes immediately about were broken and beaten down by his weight, as he had staggered to and fro in his effort to get on his legs again. Strange to say, however, we here lost all clue to the beast. A large troop of Lions that had been feasting on a Giraffe in the early morning had obliterated his tracks; and it was not until some days afterwards, and when the carcase was in a state of decomposition, that his death was ascertained. He breathed his last very near to where we were 'at fault,' but in prosecuting the search we had unfortunately taken exactly the opposite direction."

CHAPTER III.

THE CAT FAMILY—THE TIGER AND THE LEOPARD.

THE TIGER—Its Colour, Size, &c.—Geographical Distribution—Mention of the Tiger by Ancient Writers—Habits of the Tiger—Its Destructiveness—Native Superstitions—Tiger-hunting—THE LEOPARD—Historical Account—External Characters—Size—Geographical Distribution—Varieties—Habits—Love of Dog-meat—Clay-eating Propensities—Attracted by Small-pox Patients.

THE TIGER.*

As the Lion is king of beasts in Central Africa, so the Tiger reigns supreme on a large portion of Southern Asia, where it is the most dreaded foe of the native, and the noblest game of the English sportsman. Its great size, its wonderful activity and strength, its glorious colouring, make it, in many respects, the most striking of all the great Carnivora. The marvellous symmetry of its form, making it almost as much a "line of beauty in perpetual motion" as the Greyhound; the flame-like bands of orange-yellow, with interspersed black shadows, winding over its lithe sides and terrible countenance;

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* *Felis tigris.*

the ferocity of its disposition, and its seeming uselessness for anything but destruction, have been the theme of one of the weirdest, most wonderful melodies of the artist-poet Blake, who sings of it thus :—

> "Tiger, tiger, burning bright
> In the forests of the night,
> What immortal hand or eye
> Could frame thy fearful symmetry?
>
> "In what distant deeps or skies
> Burnt the fire of thine eyes?
> On what wings dare he aspire?
> What the hand dare seize the fire?
>
> "And what shoulder, and what art,
> Could twist the sinews of thy heart?
> And when thy heart began to beat,
> What dread hand? and what dread feet?
>
> "What the hammer? What the chain?
> In what furnace was thy brain?
> What the anvil? What dread grasp
> Dare its deadly terrors clasp?
>
> "When the stars threw down their spears,
> And water'd heaven with their tears,
> Did He smile His work to see?
> Did He who made the lamb make thee?
>
> "Tiger, tiger, burning bright
> In the forests of the night,
> What immortal hand or eye
> Dare frame thy fearful symmetry?"

A recent writer* is very anxious to depose the Lion from the post of honour usually assigned to him, that the "Royal Tiger" may reign in his stead. And, although Englishmen will never feel quite happy to see the "Emperor of India" put even on an equality with the "British Lion," we can hardly help thinking that an unprejudiced person would consider the flowing mane and tufted tail of the Lion more than counterbalanced by the brilliant colour, more perfect form, and superior size of the Tiger.

The anatomical characters are so similar to those of the other Cats, that it is needless to dwell upon them; they are, indeed, for the most part so exactly like those of the Lion, that even the illustrious Cuvier is said to have been completely worsted in an attempt to separate the mingled bones of the two species. In the skull, however, the muzzle is shorter than in the Lion, and forms a bolder curve with the forehead, a character very well seen in the living animal, and making the Tiger's face much rounder, and more like that of the Domestic Cat than the Lion's. In the skeleton, as in that of other Cats, the flexibility of the spinal column is very noticeable, as also is the arrangement of the limb bones, especially those of the hind limb, which are so disposed as to form a sort of double C-spring. (See the figure of the Lion's skeleton on p. 5.) When a Tiger leaps, he first crouches down, bending the backbone into a strong downward curve by means of the great muscles which lie beneath it, at the same time contracting the flexor muscles of the limbs, more particularly of the hind limbs, so as to make their three divisions—thigh, leg, and foot—set at an acute angle to one another. He then brings into play the immense extensor muscles, which are especially well developed in all leaping animals, the back and limbs are straightened, and the animal, weighty as it is, is projected forwards with immense force.

The pupil of the eye is round. The tail is long, and devoid of a terminal tuft, and there is no mane like the Lion's, although the cheeks bear large whisker-like tufts of stiff hairs. Similar bristles occur on the chin, lips, and eyebrows, those on the cheek being especially large, and constituting the sensitive *vibrissæ* which are so noticeable in most Cats, as well as in many other animals. All these hirsute appendages are capable of being erected when the animal is angry. For this purpose the bulb-like ends of them, which are imbedded in the skin, are covered with slips of muscular fibre from the great cutaneous muscle—that by which quadrupeds are enabled to "shiver" their skins—and these

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* Sir Joseph Fayrer: "The Royal Tiger of Bengal: his life and death."

SCENE IN THE JUNGLE.

hair muscles are provided with an abundant supply of nerves. When the muscles contract, they make the hairs "stand on end," producing a sort of magnified "goose-skin." The vibrissæ are especially sensitive, and are of great assistance to the Tiger as he makes his way through the jungle in the dark.

The great distinctive character is, of course, the colour. Of this, and of the main points of difference between the two sexes, Sir J. Fayrer writes as follows:—"The colour of a full-grown

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ROYAL TIGER.

Tiger in good health is exceedingly beautiful. The ground is of a rufous or tawny-yellow, shaded into white on the ventral surface. This is varied with vertical black stripes, or elongated ovals or brindlings. On the face and on the back of the ears the white markings are peculiarly well defined, and present an appearance as remarkable as beautiful. The depth of shade of the ground colour, and the intensity of the black markings, vary according to the age and condition of the animal. In old Tigers the ground becomes more tawny, of a lighter shade, and the black markings better defined. The young are more dusky in the ground colouring than the middle-aged or old Tigers. The depth of colour is also affected by locality and climate. Those found in forests are often of a deeper shade than Tigers found in more open localities. It is said that in more northern latitudes they are of a lighter colour, almost white. The circular white patches on the back of the ears, and the white and black about the face, are very conspicuous in the Tiger, rushing through the grass or jungle when disturbed. Brilliant as is the general colour, it is remarkable how well it harmonises with the grass or bush among which he prowls, and for which, indeed, until his charge, and the short deep growls or barkings which accompany it, reveal his presence, he may be mistaken. The Tigress differs from the Tiger; the head, as well as the whole body, is smaller and narrower. The neck is lighter, and is devoid of any crest, which, though very much smaller than the voluminous mane of the Lion, undoubtedly exists in large and old males. The Tigress is lither, more active, and when accompanied by her offspring, far more savage and bloodthirsty than the male; she will then attack, even when unprovoked; and in defence of her young, of which she is proverbially fond, is as courageous

DYING MAN-EATER.

as she is vicious. Most of the accidents that have befallen sportsmen and others who have encountered these animals have been due to Tigresses. I have seen a Tigress, accompanied by her young, charge, unprovoked, a line of Elephants, and inflict severe injuries before she was despatched. The only well-authenticated case in which a sportsman was taken out of a houdah was one in which a Tigress, in one bound, reached the sportsman, her hind feet resting on the Elephant's head, the fore feet on the rail of the houdah. The occupant, who had mortally wounded her as she sprang, was seized, and, after a short struggle, dragged or thrown to the ground. The Tigress then received another bullet, and died where she fell; the sportsman, severely wounded, was carried into camp, and slowly recovered."

As to the size of adult animals, the same author has the following remarks :—

"It is generally admitted that the Tiger attains the greatest size in India, and there can be no doubt that he is really the largest of the existing *Felidæ*. . . . . . The size of the Tiger varies; some individuals attain great bulk and weight, though they are shorter than others which are of a slighter and more elongated form. The statements as to the length they attain are conflicting and often exaggerated; errors are apt to arise from measurements taken from the skin after it is stretched, when it may be ten or twelve inches longer than before removal from the body. The Tiger should be measured from the nose along the spine to the tip of the tail as he lies dead on the spot where he fell before the skin is removed. One that is ten feet by this measurement is large, and the full-grown male does not often exceed this, though no doubt larger individuals (males) are occasionally seen, and I have been informed by Indian sportsmen of reliability that they have seen and killed Tigers over twelve feet in length. The full-grown male Indian Tiger, therefore, may be said to be from nine to twelve feet, or twelve feet two inches, the Tigress from eight to ten, or perhaps, in very rare instances, eleven feet in length, the height being from three to three and a half, or, very rarely, four feet at the shoulder. But we must look with doubt on Buffon's statement that one had attained a length of fifteen feet; and with even greater hesitation can we accept the recorded statement that Hyder Ally presented a Tiger to the Nawab of Arcot that measured eighteen feet."

The Tiger is entirely confined to Asia, where its range is very wide, extending from the Caspian to the Sea of Okhotsk, and from latitude 50° southwards. It has been found in the Elburz Mountains, Bokhara, China, Malaysia, Sumatra, Borneo, Java, and Bali. It is known about Ceylon and from the great table-land of Tibet. Its head-quarters are North India, where great numbers are killed annually. From what has been said, it will be evident that the Tiger is by no means, as one is very apt to imagine, an altogether tropical animal; the Caucasus, the western limit of its range, is far from being a warm region, and its eastern limit, the island of Saghalien, is as far north as Kamtchatka. It has been found also at a height of 8,000 feet above sea-level. It is an interesting circumstance that the Tigers found amongst the snows of Mantchuria and Corea have the "body covered with long softish hairs," and a shaggy ruff round the neck. Thus, as is so constantly the case, a definite variety is produced solely by the action of surrounding conditions. Certain Tigers find it advantageous to live farther north than the generality of their kind, so as to have a freer field for their depredations than would be afforded to them by the more southern districts, and, to suit themselves to the vigorous climate, acquire long warm fur, such as would be quite out of place on the back of a denizen of the Bengal jungles.

It is a somewhat remarkable circumstance, considering the nearness of Palestine to the Caucasus and Elburz Mountains, that the Tiger is not once mentioned in the Bible. It was, however, well known to the Greeks and Romans, and, like the Lion, was a regular performer at the amphitheatre. The district called Hyrcania, a tract of land lying to the south-east of the Caspian Sea, seems to have been the most noted spot for Tigers. In the "Æneid," Dido, in her magnificent declamation against the perfidy of Æneas, is made to say—

> "Nec tibi Diva parens, genius nec Dardanus auctor,
> Perfide, sed duris genuit te cautibus horrens
> Caucasus, *Hyrcanæque* admôrunt ubera tigres."
>
> "(Perfidious monster! boast thy birth no more;
> No hero got thee, and no goddess bore:
> No! thou wert brought by Scythian rocks to day,
> By Tigers nurs'd and savages of prey.)"

and Shakspere uses the same expression :—

> "The rugged Pyrrhus, like the *Hyrcanian* beast."

In disposition the Tiger differs but little from the other wild *Felidæ*. Although possessed of such immense strength and ferocity, he often shows himself a very coward. Like most animals he scarcely ever attacks an armed man unless provoked, that is, unless he (or she) be a confirmed "man-eater," although often seizing upon women and children. He shares with our Domestic Cat a love of cruelty for its own sake. The author of "Rambles in the Mirzapore District" says of this essentially feline character:—"It is sometimes an interesting sight to witness the demeanour of a Tiger towards his terrified prey (*i.e.*, when a victim is tied up for him, and the sportsman waits to shoot him in the tree above it). When not raging with hunger, he appears to derive the same pleasure from playing with his victim as a Cat in tormenting a Mouse. He gambols around the Buffalo as if enjoying his alarm; and when the affrighted animal, in mad despair, feebly attempts to butt at his remorseless foe, the Tiger bounds lightly over his head, and recommences his gambols at the other side. At last, as if he had succeeded in creating an appetite for dinner, he crushes the skull of his victim with one blow of his powerful fore-paw, and soon commences his bloody meal."

Another point in which the Tiger resembles the Cat is the devotion of the female to her offspring, and the remarkably lively and skittish disposition of the "kittens," of which from two to five are usually produced at a birth. These are at first about half the size of our Domestic Cat. The mother goes with young about 105 days, the breeding season being in the early part of the year, but varying slightly according to locality. She is a most affectionate and attached mother, and generally guards and trains her young with the most watchful solicitude. They remain with her until nearly full grown, or about the second year, when they are able to cater for themselves. Whilst they remain with her she is peculiarly vicious and aggressive, defending them with the greatest courage and energy, and when robbed of them is terrible in her rage; she has nevertheless been known to desert them when pressed, and even to eat them when starved.

As soon as they begin to require other food than her milk she kills for them, and teaches them to do so for themselves by practising on small animals, such as Deer, and young Calves and Pigs. At these times she is wanton and extravagant in her cruelty, killing apparently for the gratification of her ferocious and bloodthirsty nature, and, perhaps, to excite and instruct the young ones, and it is not until they are thoroughly capable of providing their own food that she separates from them.

The young Tigers are far more destructive than the old. They will kill three or four Cows at a time, whilst the elder and more experienced rarely kill more than one, and this at intervals of from three or four days to a week. For this purpose the Tiger will leave its retreat in the dense jungle, proceed to the neighbourhood of a village, and during the night will steal towards the herds and strike down a Bullock, drag it into a secluded place, and then remain near the "murrie," or kill, for several days, until it has eaten it, when it will proceed in search of a further supply. When it has once found good hunting-ground in the vicinity of a village, it continues its ravages, destroying one or two Cows or Buffaloes a week. It is very fond of the ordinary domestic cattle which, in the plains of India, are generally weak, half-starved, under-sized creatures. One of these is easily struck down and carried or dragged off. The smaller Buffaloes are also easily disposed of, but the Buffalo Bulls, and especially the wild ones, are formidable antagonists, and have often been known to beat the Tiger off, and even to wound him seriously with their horns.

Some notion of the fearful damages committed by Tigers in India will be gained from the following extract:—"Cattle killed in my district are numberless. As regards human beings, one Tiger in 1867–8–9, killed, respectively, twenty-seven, thirty-four, forty-seven people. I have known it attack a party and kill four or five at a time. Once it killed a father, mother, and three children; and the week before it was shot it killed seven people. It wandered over a tract of twenty miles, never remaining in the same spot two consecutive days, and at last was destroyed by a bullet from a spring gun, when returning to feed on the body of one of its victims—a woman. At Nynee Tal, in Kumaon, in 1856–7–8, there was a Tiger that prowled about within a circle, say, of twenty miles, and it killed, on an average, about eighty men per annum. The haunts were well known at all seasons. . . . . This Tiger was afterwards shot while devouring the body of an aged person it had killed." It is also stated in a Government report that "in one instance, in the Central Provinces, a single Tigress caused the desertion of thirteen villages, and two hundred and fifty square miles of country were thrown out of cultivation. This state of things would, undoubtedly, have continued, but for the timely arrival of a gentleman who, happily, was fortunate enough, with the aid of his gun, to put an end to her eventful career." Again, it is reported, "that one Tigress, in 1869, killed 127 people, and stopped a public road for many weeks, and was finally killed by the opportune arrival of an English sportsman."

As might naturally be expected, an enemy so dreadful is sure to have supernatural power ascribed to it by the credulous natives, whose property is destroyed, and whose lives are endangered by the ravages of this terrible beast. People in the state of civilisation of the ordinary Indian villages are sure to think there is something more than natural in an animal capable of such wholesale destruction, so wantonly cruel, of such fearful strength and such terrible beauty; and the following passages will give some idea of the prowess ascribed to the Tiger by those who are the greatest sufferers from his bloody disposition :—

"The natives of India, especially the Hindoos, hold the Tiger, as they do the Cobra, in superstitious awe. Many would not kill him if they could, for they fear that he will haunt them or do them mischief after death. Some they regard as being the tenement of a spirit, which not only renders them immortal, but confers increased powers of mischief. In many parts of India the peasants will hardly mention the Tiger by name. They either call him, as in Purneah, Giahur (Jackal), Janwar (the beast), or they will not name him at all; and it is the same in the case of the Wolf. But though they will not always themselves destroy him, they are quite willing that others should do so, for they will point out his whereabouts, and be present at his death; and the delight evinced thereat is intense, for it often relieves a whole village from an incubus of no slight weight, and saves the herdsman from his weekly loss of cattle. The conversation and remarks made by these villagers round the fallen Tiger are often very amusing and characteristic.

"All kinds of power and influence are ascribed to portions of him when dead; the fangs, the claws, the whiskers, are potent charms, medicines, love-philtres, or prophylactics against disease, the evil eye, or magic. They are in such demand that the natives *will* take them; and we have known whiskers, claws, and even fangs, extracted and carried away during the night, even when the dead Tiger has been placed under the surveillance of a guard. The fat, also, is in great demand, for its many potent virtues in relieving rheumatism and other ailments. The liver, the heart, and the flesh are taken away and dried, to be eaten as tonics or invigorating remedies that give strength and courage. There is also a popular delusion that a new lobe is added to the liver every year of his life. A Tiger's skin with its whiskers preserved is a rarity; you cannot keep them. The domestic, who would preserve any other valuable as a most sacred trust, will fail under this temptation! The whiskers, besides other wonderful powers, are said to possess that of being a slow poison when administered with the food. Such is the belief, which you may try in vain to disturb! The clavicles, too—little curved bones like tiny ribs—are also much valued; but they are generally lost or overlooked when the Tiger is cut up, lying buried in the powerful muscles near the shoulders."

It is a very common opinion that the wounds made by a Tiger's claw or teeth are poisonous, and consequently highly dangerous. It is, however, hardly necessary to state that the Tiger's venom is of quite the same nature as that of the Frog and Newt, which so many country people believe in devoutly to this day. The huge jagged canines, and the carefully sharpened claws make wounds which are certainly ugly enough, but their danger arises merely from their depth, and from their liability to fester in a hot climate.

Of course Tiger-hunting is, *par excellence*, the "royal sport of India;" the game calling forth more courage and address from the sportsman than any other, and the "spice of danger" so necessary to the true sportsman being at its maximum. Usually, a hunt is made up of a considerable number of sportsmen, accompanied by a crowd of beaters. The Elephant upon which each hunter rides is provided with a houdah of light wood and basket work, and consisting of two compartments, a front one in which the sportsman himself sits, and a hinder one occupied by his servant, who is in readiness with spare guns. The driver, or mahout, sits on a cushion on the Elephant's neck, armed with a pointed iron rod, or *gujbag*, to every touch of which the docile animal answers.

On arriving at a portion of the jungle where Tigers are known to exist, the sportsmen hold themselves in readiness with loaded rifles, while the beaters, on foot, encircle the jungle, and endeavour, with shouts and gesticulations, to drive the game from their lurking-place to the destruction which awaits them. As soon as a Tiger appears every piece is levelled at him, and, in many cases, he is despatched at once; but often he is either entirely missed, or only slightly wounded, and then he at once makes for the nearest Elephant, and often succeeds in making Elephant, or mahout, or even sportsman, feel his cruel teeth and claws, before the *coup de grace* is given. A Tiger is at no time the easiest thing to kill; like its humble kinsman, the Cat, it has "nine lives" to part with, and these lives are much more tenacious than in the case of poor puss. A Tiger, holding on with tooth and claw to a writhing Elephant, in such a position that a mis-directed shot may kill man or Elephant instead of Tiger, is an extremely awkward beast indeed to deal with, and is often enabled to sell his life very dearly. When the day's sport is over, the Tigers are either carried into camp on pad Elephants, or skinned where they lie; the natives possessing themselves of the flesh, and everything else of which they can lay hold.

TIGER HUNT.

The foregoing is the legitimate method of keeping down the Tiger race, but many others are employed. "They are snared in pitfalls and traps, shot by spring-guns and arrows, occasionally poisoned, and it is said that bird-lime has been used in their destruction. I have read of this, but know of no authenticated case in which it has been practised. The bird-lime, it is said, is spread on the fallen leaves; these adhering to the Tiger's paws are soon plastered all over him, including his face and eyes. Blinded and stupefied by rage and fear, he falls an easy prey to the villagers, who then either shoot or stab him to death with spears. Another mode of effecting his death is to lay a bait, by tying up a Cow or Goat in some spot the Tiger is wont to frequent. Near this, on a machán, or on the branch of a tree, or from behind some extemporised screen, the shikarie waits his approach at night, and when the bait is seized takes aim, and often succeeds in destroying him, though it not unfrequently happens that in the uncertain light he misses altogether, or only wounds, in which case a second chance is seldom obtained."

The perils of Tiger-hunting are great and varied. In the following instance related by Sir Joseph Fayrer a large comic element was introduced, although the fun is probably more striking to us to read of than it was to the hunter and his mahout who took part in it:—

"A rather curious Tiger-hunt, in which the Tiger seemed to think that he should have his share of the sport as well as the 'shikarie,' occurred some short time ago in the Dhoon. A gentleman, well known in Dehra, an enthusiastic though rather inexperienced sportsman, they say, went out about a month ago, into the Eastern Dhoon, for a day or two's shooting. Arrived on the ground, he was seated in his houdah on the Elephant, looking out anxiously for game of some sort, when the mahout suddenly cried, 'Shér, Sahib; burra, Shér!' for a Tiger had made his appearance unexpectedly close to the Elephant. The gentleman hurriedly fired, and planted a ball from his rifle, not in the Tiger's shoulder, but in his abdomen. This mistake must have been due to surprise at the Tiger's sudden advent on the scene, and the consequently hurried shot; otherwise such a want of knowledge of anatomy as was evinced in seeking a vital spot in the abdomen would be unpardonable. The consequences of the mistake were serious; for the Tiger, resenting the sudden disturbance in the region where the remains of his last kill were peacefully reposing, charged the Elephant, and, by a spring, succeeded in planting his fore-paws on her head, while his hind legs clawed and scratched vigorously for a footing on her trunk.

"Imagine the feelings of the mahout, with a Tiger within six inches of his nose! the Elephant trumpeting, shaking, and rolling with rage and pain, till he was barely able to maintain his seat on her neck at all; and the occupant of the houdah, too, tumbled from top to bottom, and from side to side of it, as if he were a solitary pill in a pillbox too large for him. Of course, in this predicament, he was utterly unable to use his rifle to rid the Elephant of the unwelcome head-dress she was, perforce, wearing. The attempt to fire, in all that shaking, would probably have resulted in his blowing out the mahout's brains instead of the Tiger's, or in his shooting himself. Meanwhile the mahout, with the courage of despair, slipped out of the *gaddela*, or cushion, on which he sat, and, rolling it round his left arm, and taking the iron *gujbag* in his right, assailed the Tiger manfully about the ears. But, being thick-headed, he did not seem to mind the *gujbag* at all; for, after taking a bite at the Elephant's forehead, he calmly continued his struggles for a footing on the reluctant and ever-dodging trunk, heedless of the rain of blows on his thick skull, and, no doubt, promising himself to square accounts presently by swallowing the mahout, *gujbag*, and all. But the Elephant was beginning to see that she couldn't shake the Tiger off, so she tried another plan; and, making an extempore battering-ram of herself, with the Tiger as a buffer, she charged straight at a sal-tree, thinking to make a Tiger-pancake on the spot. But the sal-tree, alas! was a small one, and gave way under the shock, and away went tree, Tiger, and Elephant into an old and half filled-up *obi*, or Elephant pit, which happened to be conveniently placed to receive them just on the other side of the fallen tree. The Tiger and the mahout were both knocked off by the shock and fall; but the latter, luckily for himself, fell out of the pit, the former into it, under the Elephant. The Elephant now had her share of the sport, and gave the Tiger such a kicking while he lay under her, making a kind of shuttlecock of him between her fore and hind legs, that the breath must have been almost kicked out of him; then deeming she had done enough for honour and glory, and that she couldn't eat the Tiger if she did kill him, she commenced climbing out of the pit, whose crumbled and sloping sides luckily made the scramble out practicable. The mahout, who had by this time picked himself and his scattered wits up, rushed round and caught her by the ear just as she reached the level, and was preparing for a bolt, and scrambling rapidly up to his perch on her neck, succeeded in stopping her and turning her face to the foe once more. The Elephant being now under command, our sportsman at length resumed his proper share in the proceedings, and the Tiger being still at the bottom of the pit, breathless, if not senseless, from the kicking he had undergone, by a well-directed shot put him finally *hors de combat*, and had the satisfaction of carrying him into the station in triumph, where his skin is preserved as a witness of this strange Tiger-hunt. The Elephant, though it got one nasty bite, and was badly scratched about the trunk and fore-legs, is now none the worse for its single combat with the monarch of the Indian forests."

We mentioned above that the Tiger rarely attacks man unless provoked. When, however, he is hard pressed for a meal, he will often visit inhabited spots, and then is as likely to choose human as bovine food. Imagine the sensation likely to arise in a small village, inhabited only by a few unarmed, or at least but poorly armed men, with their wives and children, by such an occurrence as the following, related by an English traveller :—

"On the 11th of November of the same year I chanced to meet a Tiger myself. I was on the shore of the mainland opposite Amoy, in the afternoon, looking out for small birds, in company with a friend. I carried a gun, but had only small shot and one cartridge. Some villagers came running to us crying 'Go and shoot the Tiger!' I thought they were making game of us, until some of them assured us that there really was a Tiger in a neighbouring village, and that they would be much obliged if we would kill it. They led us to a village at the foot of a hill near the shore, where we found men, women, and children huddled outside in great alarm. Many of the men were armed with matchlocks. They desired us to take off our boots, and one of the men guided us over the roofs of the houses to the last house near the hill, and, pointing to a large rock, he made us listen. We could distinctly hear growls, and peering over I saw the lips and feet of the Tiger under the overhanging rock. The house on which we stood presented a wall facing the rock, and about two yards distant. We went inside, and I persuaded the owner to make a hole in the wall. I had no means of drawing the charge of my gun, so I rammed down a cartridge on the top of the small shot in one barrel, and a few hollow buttons into the other. In the hurry and excitement no bullets or iron nails were forthcoming. The Tiger noticed the hole in the wall, but only growled. I fired the button barrel first, aimed at its neck, but he only answered by a growl, and I saw that the buttons had done no more than turn up the skin without penetrating. His jaw was full towards me, and I gave him the cartridge right between his eyes. He gave a furious roar, and bounded into the garden, where he stood for some seconds bleeding from the nose, and with his tongue lolling from his mouth. I had no more cartridges with me, so I loaded again with the metal-edged buttons which the villagers tore off their coats for me. The Tiger had moved away, and I tracked him by his blood into a dilapidated temple. I looked in at the window, and there stretched beside a coffin sat the noble beast. He turned his head and growled as he saw me, and, without a moment's thought I raised the barrels and fired another shower of buttons in his face. I turned and fled; but a roar followed which I shall never forget, and I found myself, breathless, at the bottom of a precipice, with my gun upraised, expecting to see the angry creature upon me; but strange enough he did not follow. The villagers, who were assembled two hundred yards away, all ran when I ran; but seeing the Tiger did not pursue, one of them came forward and put me on his knees, and patting me on the back, helped to bring back my breath, which I had lost by the fall. We crept up to the window again. Every one of the thick wooden bars had been knocked out by the force of the leap; but from the blood only splashing the outside of the window, it was evident the Tiger had not come out of the building. We looked in at the window, and just below, outstretched on the floor in a pool of blood, lay the Tiger. I threw up my hand and shouted to my friend, who watched the proceedings at a distance, that the Tiger was dead. At the noise, the Tiger raised his head and growled. He was a Cat, of course, and had the usual nine lives. I went to the villagers and proposed a joint attack, but they would not consent. Some of them ascended the hills behind and fired on to the roof of the house in which the Tiger was sheltered. It was getting dark, so breathless and hurt I took boat and returned to Amoy. A few hours after the Tiger is said to have moved away; but whether he died or recovered his wounds I could never satisfactorily learn, so contradictory were the stories told."

Mr. Thomson recounts a tale of a planter in this province, who, returning home after a carouse, a little too much under the influence of Scotch whisky, was sorely bested by a Tiger. "It was rather dark, and verging on the small hours of morning when MacNab, mounting on his trusty steed, set his face towards home. Feeling at peace with all men, and even with the beasts of prey, he cantered along a road bordered with mangroves, admiring the fitful gleams of the fire-flies that were lighting their midnight lamps among the trees. But soon the road became darker, and Donald, the pony, pricked his ears uneasily as he turned into a jungle-path which led towards the stream. Donald snuffed the air, and soon redoubled his pace, with ears set close back, nostrils dilated, and bristling mane. Onward he sped, and at last the angry growl of a Tiger in full chase behind roused MacNab to the full peril of his position, and chilled his blood with the thought that his pursuer was fast gaining ground, and that at any moment he might feel the clutch of his hungry and relentless claws. Here was a dilemma, the cold creek before him, and the hot breath of the Tiger in the rear. A moment or two were gained by tossing his hat behind him, and then Donald cleared the stream at a bound. The Tiger lost his scent, and Mr. MacNab reached home in safety, by what he delighted to describe as a miraculous escape."

To us, who "live at home at ease," life would seem to be hardly bearable in a place when one is liable, any day, to meet with such an adventure as this—with every chance, too, of a less pleasant termination. But it is astonishing how indifferent to the presence of wild beasts the inhabitants of these countries become. Even Europeans soon acquire the same fearlessness, or, rather, apathy. Of this Mr. Thomson gives a striking illustration:—"In these sparse settlements of Malays and Chinese, Roman Catholic missionaries are at work. I once fell in with one of these priests, shod with straw sandals, and walking alone towards Bukit, Mer-tangrim (the pointed hill), to visit a sick convert who had a clearing upon the mountain-side. His path lay through a region infested with wild animals; and when I inquired if he had no dread of Tigers, he pointed to his Chinese umbrella, his only weapon, and assured me that with a similar instrument a friend of his had driven off the attack of a Tiger not very far from where we stood. But the nervous shock which followed that triumph had cost the courageous missionary his life."

THE LEOPARD.*

The Leopard, or Panther, is undoubtedly the third in importance and interest of the great Cats. From a historical point of view it is more interesting than the Tiger, and would naturally come immediately after the Lion, but its size, ferocity, and beauty are so very inferior to the Tiger's that it must needs yield to the glorious Bengalee. In the matter of beauty alone it is eclipsed by the Jaguar, but the fact of its having been known from very ancient times, and that of its occurrence in our own hemisphere, must decide us, in the absence of any important characters, anatomical or otherwise, to give it the precedence of its very nearly related American cousin.

The Leopard was the only one of the greater feline animals, except the Lion and Tiger, that seems to have been known to the ancients. It is always represented as drawing the chariot of Bacchus, and the forlorn Ariadne is sculptured as riding on one of the spotted steeds of her divine lover. The Panther was also constantly used in the barbarous sports of the amphitheatre, and, in common with the Lion and Tiger, has been both executioner and grave to many a bold-hearted martyr.

The Leopard's skin was a favourite mantle in the olden times in Greece. In the "Iliad," Homer, speaking of Menelaus, says—

"With a Pard's spotted hide his shoulders broad
He mantled o'er,"——

and the Leopard, or Panther, is given in the "Odyssey" as one of the forms assumed by Proteus, "the Ancient of the Deep."

A curious ancient superstition about the Leopard is embodied in its name. It was thought not to be actually the same animal as the Panther or Pard, but to be a mongrel or hybrid between the male Pard and the Lioness: hence it was called the Lion-panther, or *Leopardus*. This error, as Archbishop Trench tells us, "has lasted into modern times; thus Fuller, 'Leopards and Mules are properly no creatures.'" Another word-combination was made by the Romans when wishing to find a name for the Giraffe. It is "a creature combining, though with infinitely more grace, yet some of the height and even the proportions of a *Camel*, with the spotted skin of the *Pard*." They called it "Camelopardus," the Camel-panther.

Some authors give it as their opinion that the Leopard outshines all the great beasts of prey in beauty and elegance, and, indeed, called it *the* Carnivore *par excellence.* Unfortunately, most English people have no means of forming a true opinion on a matter of this sort, as we see the animals only in menageries; but judging from the specimens we have seen in confinement, we should incline to the belief that it is far behind both the Lion and Tiger, and is even beaten by the Jaguar in the matter of colouring, although the surly look of the latter makes him, on the whole, a far less attractive beast. The adult Leopard in the London Zoological Gardens is perhaps the clumsiest brute in the whole Lion-house—fat, bull-necked, and stupid-looking. Stupid-looking, and even clumsy, that is, when lying lazily asleep on the floor of his den; but watch him when four o'clock comes, and the meat-barrow goes round, and then where will you find more marvellous agility? All the Cats are alike in this; they are very lazy at times, but when they *do* begin to move, there is no more complete example of perfectly graceful movement, and one feels as if he could watch them "on and off for days and days," as Alice's frog-footman puts it.

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* *Felis pardus.*

LEOPARD.

The characters of the hide are so characteristic that they must be given in some detail, especially as the spots must be distinguished from those of the Jaguar, the great spotted Cat of the New World. The skin is described as follows:—"On an orange-yellow ground, passing below into white, are spots of deep or brownish-black, sometimes distinct, sometimes composed of two, three, or even four points disposed in a circle, and surrounding a space, always somewhat darker than the ground-colour, and shading into it below. On the medio-dorsal line, in the hinder part of the body, the spots are so arranged as to produce three or even four regular parallel bands. On the side of the body, also, bands are found, but they are indefinite in number, and irregularly disposed. On the head and legs, the circular spots pass by degrees into mere points. The belly is strewn with great double points, irregularly disposed, and on the legs the points, also double, unite and form bands. The tail is covered over the greater part of its length with annular spots. On the hinder part of the ears is a clear spot."

It must not be supposed, however, that all Leopards have exactly the kind of marking here described, for it varies according to habitat, age, sex, and season. Still, the skin-markings are definite enough to enable one to tell the true Leopard, either from the Hunting Leopard (Cheetah), the Jaguar, or the Clouded Tiger, the only animals with which there is any possibility of confounding it.

In size the Leopard is decidedly inferior to either the Lion or Tiger; being not more than some seven feet six inches from snout to tip of tail, and two feet seven inches high at the shoulder. The tail itself is about three feet eight inches long. The female is somewhat smaller than the male, to which the above measurements apply. The whiskers are strong and white, and the eyes yellow.

The head-quarters of the Leopard are the African continent, where its range is almost co-extensive with the Lion's, as it occurs from Algeria in the north to Cape Colony in the south. In the latter locality it is known by the settlers as the Tiger, but this is quite a misnomer. The Tiger of the Cape colonists is a *spotted*, not a *striped* Cat, and is indeed nothing but the African variety of the Panther. Like the Lion, the Leopard extends into Asia, penetrating, however, much farther into that continent than the king of beasts. In the western parts of Asia it occurs, amongst other places, in Palestine, where "it is found all round the Dead Sea, in Gilead, and Bashan, and occasionally in the few wooded districts in the West." Leopards are found in Ceylon, where they are the only great Carnivores, but where they are neither very numerous nor very dangerous, as they seldom attack man. By the Europeans the Ceylon Leopard is erroneously called a Cheetah, but the true "Cheetah" (*Felis jubata*), the Hunting Leopard of India, does not exist in the island.

The Leopard is found at its extreme easterly range in Japan, where it occurs under a distinct variety, known as the "Northern Leopard," the skin of which is "much like that of a fine-coloured Hunting Leopard, but it is at once distinguished by the comparatively shorter legs, by the larger size and brown centre of the black spots, and from all the varieties of the Leopard by the linear spots on the nape and the spots on the back not being formed of roses or groups of spots. The skin in its tanned state is four feet six inches, and the tail two feet ten inches long."

Another variety from Formosa is distinguished by the shortness of its tail, which is not more than a foot and three-quarters long, or about half the length of that of its African brother. Some naturalists propose to consider both these varieties as distinct species, but such characters as the length of the tail and the form and disposition of the spots are eminently variable, and when we consider that another Leopard from Formosa has been described with a tail one foot one inch long, and another whose caudal appendage was two feet seven inches in length, we shall certainly be justified in concluding that such slight difference must have been produced by the innate tendency of all animals to vary in unimportant particulars, and by the influence of surrounding conditions, and we may safely put all these various kinds of Leopard under the common label *Felis pardus*.

There is, however, one very interesting character about the "Northern Leopard" which, although by no means entitling it to rank as a species, yet makes it a very instructing instance of the way in which a breed or race is produced by the modifying influence of climate. The animal in question is found not only in Japan, but in Mantchuria, "extending probably to Corea, and the Island of Saghalien," and is remarkable from the fact that its hair is long and shaggy, a condition of things evidently brought about by the cold climate it has to endure. Hence we see that the British climate need not have differed from its present condition to have been the home, as indeed it once was, of the larger beasts of prey.

Perhaps the most interesting variety of this species is the Black Leopard of Java. It has exactly the appearance of an ordinary Leopard painted black, the paint, however, not being laid on sufficiently thick to hide the spots, which are of a more intense black than the rest of the hide. The Black Leopard is sometimes described as a distinct species, and is called *Leopardus melas*, but there can be very little doubt that it is, in reality, a mere variety, differing only in colour—the most variable of characters—from the common kind. It is, however, so singular as to require the special notice which we have given it.

"Leopards frequent the vicinity of pasture-lands in quest of the Deer and other peaceful animals which resort to them; and the villagers often complain of the destruction of their cattle by these formidable marauders. In relation to them the natives have a curious but firm conviction that when a Bullock is killed by a Leopard, and, in expiring, falls so that *its right side is undermost,* the Leopard will not return to devour it. I have been told by English sportsmen (some of whom share in the popular belief), that sometimes, when they have proposed to watch by the carcase of a Bullock recently killed by a Leopard, in the hope of shooting the spoiler on his return in search of his prey, the native owner of the slaughtered animal, though earnestly desiring to be avenged, has assured them that it would be in vain, as, the beast having fallen on its right side, the Leopard would not return.

"The Singhalese hunt them for the sake of their extremely beautiful skins, but prefer taking them in traps and pitfalls, and occasionally in spring cages formed of poles driven firmly into the ground, within which a Kid is generally fastened as a bait, the door being held open by a sapling bent down by the united force of several men, and so arranged as to act as a spring, to which a noose is ingeniously attached, formed of plaited Deer's hide. The cries of the Kid attract the Leopard, which, being tempted to enter, is enclosed by the liberation of the spring, and grasped firmly round the body by the noose."*

There is a Scottish adage which says that "Hawks will not peck out hawks' een;" but the Leopard, a Carnivore, has a confirmed liking for the flesh of the flesh-eating Dog. This fact has been observed by a writer who states that the Leopard has quite a mania for that sort of diet, and will not hesitate to penetrate into a tent at night in quest of his favourite game.

There is a rather curious habit of the Leopards which we have observed at the Zoological Gardens, though whether it holds good with all Leopards we are not prepared to say, never having seen the circumstance mentioned. The Lion and Tiger, when devouring their reeking bones at their four o'clock dinner, at Regent's Park, lie down at full length, and hold the meat between their fore-paws, in this way steadying it while they take their tremendous bites. The Leopards, on the other hand, do not lie down, but squat on their haunches, the fore-legs being kept almost vertical, and the head, of course, correspondingly bent down to reach the food. The paws are rarely used to steady the piece of meat, and only, in fact, when the beast comes across a particularly fractious morsel which he finds it impossible to manage with his teeth alone. For this reason, a Leopard in the act of feeding is a far more awkward-looking beast than the Lion or Tiger, both of which hold their food in quite a civilised way.

In connection with the Leopard's mode of feeding, we may mention a curious tale about its diet. There can be little doubt that it is a mere "yarn," or rather a piece of folk-lore, but still it is interesting, especially when we think of the many tales of clay-eating men:—"The natives [of Ceylon] assert that it devours the *kaolin* clay, called by them *kiri mattee,* in a very peculiar way. They say that the Cheetah [Leopard] places it in lumps beside him, and then gazes intently on the sun, till, on turning his eyes on the clay, every piece appears of a red colour like flesh, when he instantly devours it."

As a rule, the Leopard seems to be far more cowardly than the Lion or Tiger. Jules Gérard, the Lion-killer, holds the beast in the greatest contempt for its pusillanimity. Still, it often shows a good deal of pluck, chiefly, however, when in want of food. As to this matter, the actual experience of those who have observed the animal in its native land will convey a truer idea than any summing up of its good and bad points. "One night I was suddenly awoke by a furious barking of our Dogs, accompanied by cries of distress. Suspecting that some beast of prey had seized upon one of them, I leaped, undressed, out of my bed, and, gun in hand, hurried to the spot whence the cries proceeded. The night was pitchy dark, however, and I could distinguish nothing; yet, in the hope of frightening the intruder away, I shouted at the top of my voice. In a few moments a torch was lighted, and we then discovered the marks of a Leopard, and also large patches of blood. On counting the Dogs, I found that 'Summer,' the best and fleetest of our kennel, was missing. As it was in vain that I called and searched for him, I concluded that the Tiger [Leopard] had carried him away; and, as nothing further could be done that night, I again retired to rest; but the fate of the poor animal continued to haunt me, and drove sleep away. I had seated myself on the front chest of the wagon, when suddenly the melancholy cries were repeated, and on rushing to the spot, I discovered 'Summer' stretched at full length in the middle of a bush. Though the poor creature had several deep wounds about his throat and chest, he at once recognised me, and, wagging his tail, looked wistfully in my face. The sight sickened me as I carried him into the house, where, in time, however, he recovered. The very next day 'Summer' was revenged in a very unexpected manner. Some of the servants had gone into the bed of the river to chase away a Jackal, when they suddenly encountered a Leopard in the act of springing at our Goats, which were grazing, unconscious of danger, on the river's bank. On finding himself discovered, he immediately took refuge in a tree, when he was at once attacked by the men. It was, however, not until he had received upwards of sixteen wounds—some of which were inflicted by poisoned arrows—that life became extinct. I arrived at the scene of conflict only to see him die. During the whole affair, the men had stationed themselves at the foot of the tree, to the branches of which the Leopard was pertinaciously clinging, and, having expended all their ammunition, one of them proposed, and the suggestion was taken into serious consideration, that they should pull him down by the tail."

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* Sir James Emerson Tennent, "Sketches of the Natural History of Ceylon."

One of the most remarkable circumstances related about the Leopard is the way in which it is attracted by persons suffering from small-pox; the odour attending that disease seems to have an irresistible fascination for them. Sir Emerson Tennent says that the medical officers at small-pox hospitals have to take special precautions against Leopards, which invariably haunt the spot.

As with the other *Felidæ*, the only value of the dead Leopard is the price of its skin, no truly carnivorous animal being good eating; although it is related that one of the South African tribes will eat the flesh, not only of the Leopard, but even of the Hyæna, when they are hard pressed for food.

CHAPTER IV.

THE CAT FAMILY: THE JAGUAR, THE SMALLER WILD CATS, THE DOMESTIC CAT.

THE JAGUAR—Its Character, Distribution, and Habits—Fondness for Negroes—THE PUMA—Its Character, Geographical Range, and Habits—Mode of Hunting the Puma—THE OUNCE—THE CLOUDED TIGER—The Character of its Fur, &c.—Its Habits—THE OCELOT—THE MARBLED TIGER-CAT—THE VIVERRINE CAT—THE PAMPAS CAT—THE LONG-TAILED TIGER-CAT—THE MARGAY—THE COLOCOLO—THE JAGUARONDI—THE EYRA—THE SERVAL—THE RUSTY-SPOTTED CAT—THE LEOPARD CAT—THE BAY CAT—THE SPOTTED WILD CAT—THE MANUL—THE EGYPTIAN CAT—THE COMMON WILD CAT—THE DOMESTIC CAT—Historical Sketch—Characters of Skin, &c.—Connection between Whiteness and Blindness — Habits — Use of Whiskers — Diet—Poaching Propensities — Fondness for Offspring— Foster-Children—Madness in Cats—Varieties—The Angora Cat, Manx Cat, Persian Cat, and Chinese Cat.

THE JAGUAR.*

THE Jaguar takes the place of the Leopard in America, where it is the most formidable of beasts of prey. It extends across the whole of the central part of the continent; its northern limit being the south-west boundary of the United States.

It is a slightly larger animal than the Leopard, fierce and sulky in expression, but more elegant in form, and far handsomer as to its skin. The spots are arranged in larger and more definite groups, each group consisting of a ring of well-defined black spots enclosing a space of a somewhat darker tawny than the ground-colour, in which lesser spots often occur.

The Jaguar is perhaps the fiercest-looking of all the great Cats, having an extremely ferocious expression and a horrid habit of showing its great fangs. Some time ago we were taken over the fine Lion-house in the Zoological Gardens by the Superintendent, Mr. Bartlett, to whose practical genius for everything that relates to the comfort of the animals under his charge most of the perfections of that structure are due. The little sleeping apartments at the back of the den open by iron doors into a long corridor, and in each of the doors is a small hole about the size of a penny, through which the keeper can look. Mr. Bartlett blew sharply through the hole in the den of the Jaguar's cage, and then allowed us to look through, and there was something terrible in the way the savage beast rushed at the door, growling and "swearing" like a very large and fierce Tom Cat. Even the knowledge of the strong iron door between us and the Jaguar could not prevent us from starting back, there was something so suggestive, in the beast's looks, of being torn to pieces and devoured.

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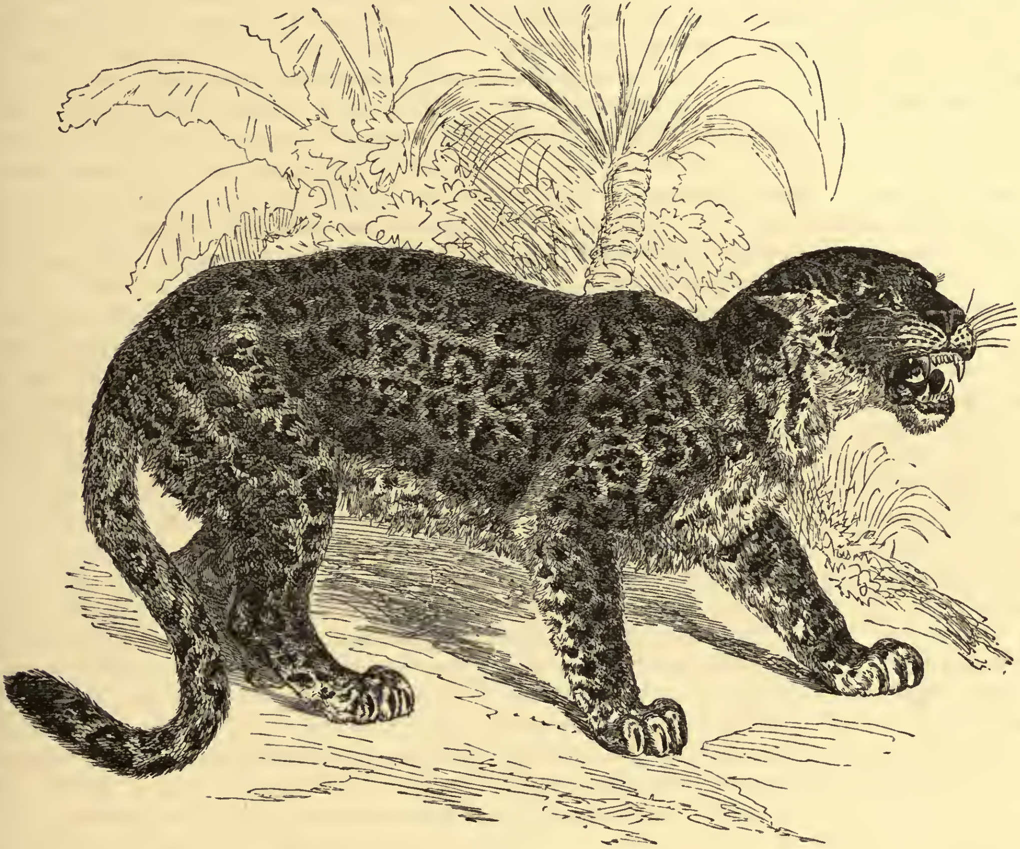
* *Felis onca.*

The Jaguar is found in North and South America, extending from the Southern regions of the United States, through Mexico, Central America, and Brazil, as far south as Paraguay. Of its habits, occurrence, &c., the following interesting account is given by Mr. Darwin :*—

"The wooded banks of the great rivers appear to be the favourite haunts of the Jaguar; but south of the Plata, I was told that they frequented the reeds bordering lakes. Wherever they are, they seem to require water. Their common prey is the Capybara, so that it is generally said, where Capybaras are numerous there is little danger from the Jaguar. Falconer states that near the southern side of the mouth of the Plata there are many Jaguars, and that they chiefly live on fish. This account I have heard repeated. On the Paranà they have killed many wood-cutters, and have even entered vessels at night. There is a man now living in Bajada, who, coming up from below when it was dark, was seized on the deck; he escaped, however, with the loss of the use of one arm. When the floods drive these animals from the islands, they are most dangerous. I was told that, a few years since, a very large one found its way into a church at Santa Fé: two padres entering one after the other were killed, and a third, who came to see what was the matter, escaped with difficulty. The beast was destroyed by being shot from a corner of the building, which was unroofed. They commit also at these times great ravages among Horses and



JAGUAR.

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* "Naturalist's Voyage."

cattle. It is said that they kill their prey by breaking their necks. If driven from the carcass, they seldom return to it. The Gauchos say that the Jaguar, when wandering about at night, is much tormented by the Foxes yelping as they follow him. This is a curious coincidence with the fact which is generally affirmed of the Jackals accompanying, in a similarly officious manner, the East Indian Tiger. The Jaguar is a noisy animal, roaring much by night, and especially before bad weather. One day, when hunting on the banks of the Uruguay, I was shown certain trees to which these animals constantly recur for the purpose, as it is said, of sharpening their claws. I saw three well-known trees; in front, the bark was worn smooth as if by the breast of the animal, and on each side there were deep scratches, or rather grooves, extending in an oblique line, nearly a yard in length. The scars were of different ages. A common method of ascertaining if a Jaguar is in the neighbourhood is to examine these trees. I imagine this habit of the Jaguar is exactly similar to one which may any day be seen in the common Cat, as with outstretched legs and exserted claws it scrapes the leg of a chair; and I have heard of young fruit-trees in an orchard in England having been thus much injured. Some such habit must also be common to the Puma, for on the bare hard soil of Patagonia I have frequently seen scores so deep that no other animal could have made them. The object of this practice is, I believe, to tear off the ragged points of their claws, and not, as the Gauchos think, to sharpen them. The Jaguar is killed, without much difficulty, by the aid of Dogs baying and driving him up a tree, where he is despatched with bullets."

It has been stated that great contests take place between the Jaguars and the Alligators which frequent the rivers of the regions in which the great Cat lives. It is said that the Jaguar is fully a match for the Alligator on land, while in the water the reptile has usually the best of it. The tale must, however, be taken *cum grano salis.* A very curious fact is mentioned by Brehm, namely, that the Jaguar always attacks Negroes and Indians in preference to whites, and that a white man, obliged to sleep in the open air in a dangerous locality, always feels perfectly safe if accompanied by natives. It is thought that this is probably due to the strong odour which characterises the skin of the Negro and other dark races. As tending to confirm this extraordinary statement, we may mention an anecdote told us by the late Prof. P. M. Duncan, F.R.S., of the behaviour of the great *Felidæ* at the Zoological Gardens towards coloured people. Every one must have noticed the calm, supercilious, way in which those grand creatures regard the visitors to their abode, seeming to look on them as beings of an inferior race come to pay rightful homage to strength and beauty; except at feeding-time, they seem hardly to give a thought to the admiring crowds in their house of reception, but pace regularly up and down their dens, or sit with paws thrust out between the bars, stolidly gazing. Several years ago, however, when the Prince of Wales's Indian animals were exhibited at the Gardens, a little black boy, one of the attendants attached to the collection, often passed through the Lion-house; and when he did so, every Cat in the place started to its feet, and rushed to the bars of its cage with great demonstrations of anger and ferocity. They evidently felt that here, at least, was one of the black, two-legged animals on which their fathers and grandfathers had fed from time immemorial, and that now was their time to strike for a pleasant change of diet, after the monotony of beef bones, ignominiously cut up and parcelled out to them.

THE PUMA.*

The Puma, or "South American Lion," is the second great American Carnivore. It occurs far more widely spread in the continent than the Jaguar, ranging from the cold regions of the Strait of Magellan up to 50° or 60° north latitude. In appearance it is not unlike a small Lioness, having a tint somewhat similar to the characteristic tawny colour of the monarch of Africa, but darker, greyer, and less rich; the mane, too, is absent. Its head is proportionally, as well as absolutely, much smaller than that of the Lion; its face is rounder, and it is altogether a much smaller beast: its average size being about thirty-nine or forty inches from the snout to the root of the thick, strong tail, the latter again being some twenty-five or twenty-six inches long, and the height about the same. Indistinct spots occur, as in the Lion, on the belly and the inside of the legs. The hind-quarters are very large, and are kept higher than the shoulders in walking. The skin beneath the belly is remarkably loose and pendulous.

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* *Felis concolor.*

Unlike the Jaguar, the Puma avoids water, although well able to swim when necessary. It is as much at home in trees as on solid ground, and is a terror to the Capuchin and other Monkeys which abound in the forests of South America. It is, however, a far more cowardly animal than the Jaguar, and is not feared by the natives to anything like the same degree. Mr. Darwin, who had ample opportunity of observing its habits, writes thus of it in his "Naturalist's Voyage":—

"This animal has a wide geographical range, being found from the equatorial forests, throughout the deserts of Patagonia, as far south as the damp and cold latitudes (53° to 54°) of Tierra del Fuego. I have seen its footsteps in the Cordillera of Central Chili, at an elevation of at least 10,000 feet. In La Plata the Puma preys chiefly on Deer, Ostriches, Bizcacha, and other quadrupeds. It there rarely attacks cattle or Horses, and most rarely man. In Chili, however, it destroys other quadrupeds. I heard, likewise, of two men and a woman who had been thus killed. It is asserted that the Puma always kills its prey by springing on the shoulders, and then drawing back the head with one of its paws until the vertebræ break. I have seen, in Patagonia, the skeletons of Guanacos, with their necks thus dislocated.

"The Puma, after eating its fill, covers the carcass with many large bushes, and lies down to watch it. This habit is often the cause of its being discovered; for the Condors, wheeling in the air, every now and then descend to partake of the feast; and being angrily driven away, rise all together on the wing. The Chileno Guaso then knows there is a Lion [Puma] watching his prey; the word is given, and men and Dogs hurry to the chase. Sir F. Head says that a Gaucho in the Pampas, upon merely seeing some Condors wheeling in the air, cried, 'A Lion!' I could never myself meet with any one who pretended to such powers of discrimination. It is asserted that if a Puma has once been betrayed by thus watching a carcass, and has then been hunted, it never resumes this habit, but that having gorged itself, it wanders far away. The Puma is easily killed. In an open country it is first entangled with the bolas,* then lazoed, and dragged along the ground till rendered insensible. At Tandil (south of the Plata), I was told that within three months one hundred were thus destroyed. In Chili they are generally driven up bushes or trees, and are then either shot or baited to death by Dogs. The Dogs employed in this chase belong to a particular breed, called 'Leoncros.' They are weak, slight animals, like long-legged Terriers, but are born with a peculiar instinct for this sport. The Puma is described as being very crafty. When pursued it often returns on its former track, and then suddenly making a spring on one side, waits there till the Dogs have passed by. It is a very silent animal, uttering no cry even when wounded, and only rarely during the breeding season."

The comparative silence of the Puma is very noticeable in the specimens at the Zoological Gardens. They never roar like other large Cats, never, in fact, getting beyond a sort of hoarse grunt; but when angry, they spit and "swear" in precisely the same manner as furious Tom Cats. In this respect they differ very markedly from the Lion and Tiger, and agree with the lesser Cats, such as the Ocelot, Serval, Lynx, &c.

The flesh of the Puma is often eaten by the Gauchos. Mr. Darwin, who tried it, pronounced it to be very white, and to taste remarkably like veal. This is a curious circumstance, as the flesh of most Carnivora is anything but palatable. While speaking of the Leopard, we mentioned its curious habit of *squatting* instead of *lying* down to eat, and of only occasionally touching its food with its paws. With the Puma this is still more remarkable; it squats in the same manner as the Leopard, but, although we have watched it many times, we never once saw it use its paws to assist in holding its food. However difficult of manipulation the bone may be, however it may slip about and object to be crunched, it never seems to occur to the animal that he might use his paws to steady it.

In captivity, the Puma, at any rate when caught young, is a tolerably docile animal, and, like the Domestic Cat, is fond of playing with inanimate objects; the Pumas at the Zoological Gardens, for instance, have a large wooden ball as a toy. They do not, however, appear to be always perfectly amiable; the female may often be seen swearing at her lord in a most reprehensible manner.

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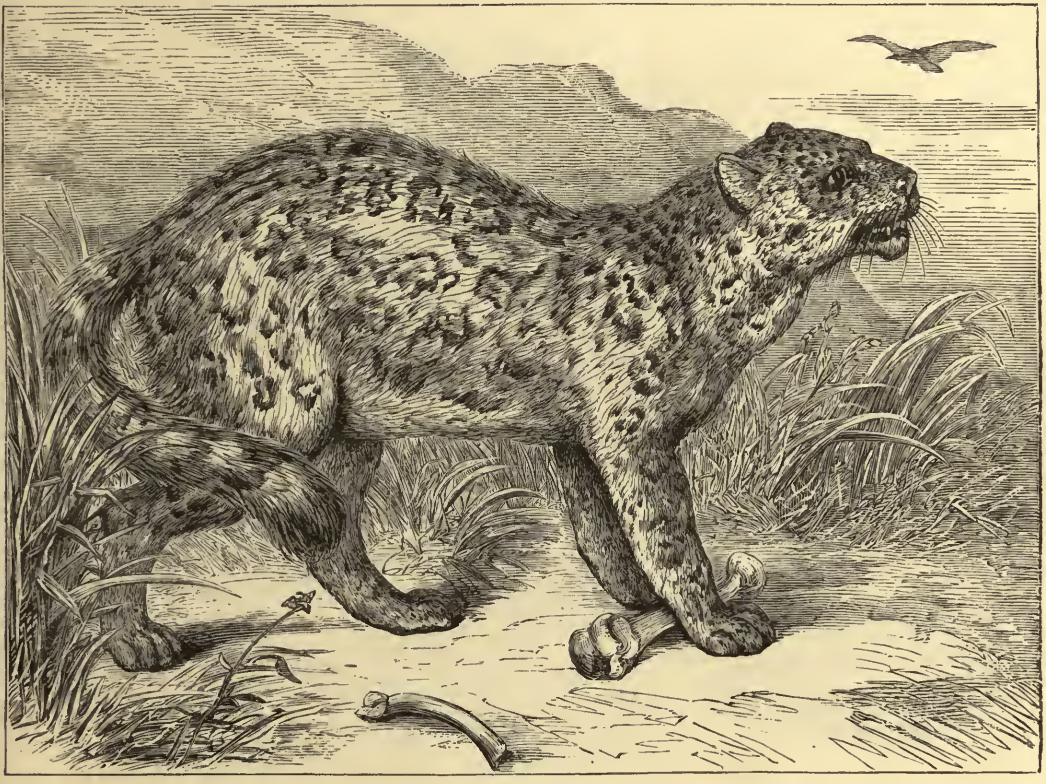
* A weapon used by the Gauchos, and consisting of three cords, knotted together at one end, and having each a ball or stone attached to the other. The smallest of these is held in the hand, and the Gaucho "whirls the other two round and round his head, then taking aim, sends them like chain shot rushing through the air."

PUMA.

THE OUNCE.*

The Ounce, or "Snow Leopard," as it is commonly called by sportsmen in the hills, is found throughout the Himalayas at a great elevation, never very much below the snows, at ranges varying with the season from 9,000 to 18,000 feet. It is said to be more common on the Tibetan side of the Himalayas; it is found also throughout the highland region of Central Asia, and extends as far west as Smyrna.

It is about the same size as the Leopard (four feet four inches long, excluding the tail), which it also resembles in habits; in fact, it may be looked upon as a Leopard specially adapted for a cold climate.



OUNCE.

The ground-colour of the skin is pale yellowish-grey, turning beneath to dingy yellowish-white. It is spotted in much the same way as the Leopard, though not so distinctly. "The fur throughout is very dense, and it has a well-marked, though short mane. The face is short and broad, and the forehead much more elevated than in any other Cat."

The Ounce is said to frequent rocky ground, and to kill the Wild Sheep as well as Domestic Sheep, Goats, and Dogs; but it has never been known to attack man.

THE CLOUDED TIGER.†

This animal, which is about intermediate in size between the great Cats, such as the Lion, Tiger, or Leopard, and the lesser kinds, such as the Ocelot, Eyra, or Tiger-Cats, is, as far as the markings of the skin are concerned, one of the most beautiful animals in the whole family. The ground-colour of the skin is not so fine as that of the Tiger, being a light buff instead of a rich orange-tawny, but the large, irregular, cloud-like patches of black are far more exquisite than the parallel bands of the Tiger; and, indeed, the only animal which in any way approaches it in the beauty of its markings is the Ocelot, and from this the Clouded Tiger certainly bears the palm. Its form is not particularly graceful, as its legs are short in comparison with the length of its body, and its snout, though longer than that of most Cats, is blunt and somewhat awkward. One of the chief beauties of this creature, however, is its magnificent tail, which is fully four-fifths the length of the body (the latter being some forty inches long), and handsomely ringed with black. The skull is much elongated, especially its facial portion, and bears a strong resemblance to that of the extinct *Felis smilodon*. The pupil is oblong and erect, not round, as in all the preceding species.

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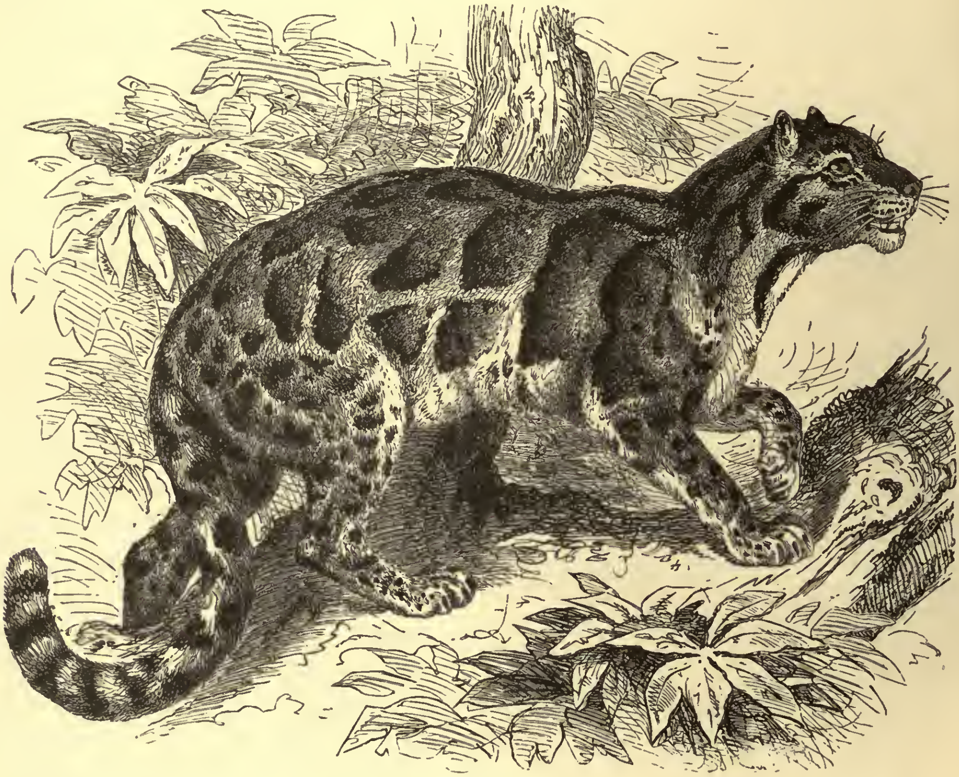
* *Felis uncia.*

† *Felis macroceliz.*

The Clouded Tiger, or *Rimau Dahan*, is found in Siam, Assam, Borneo, Java, Sumatra, and the Malayan Peninsula. It was first introduced to Great Britain by Sir Stamford Raffles, who brought two specimens with him to England, of which he gives the following interesting account:—

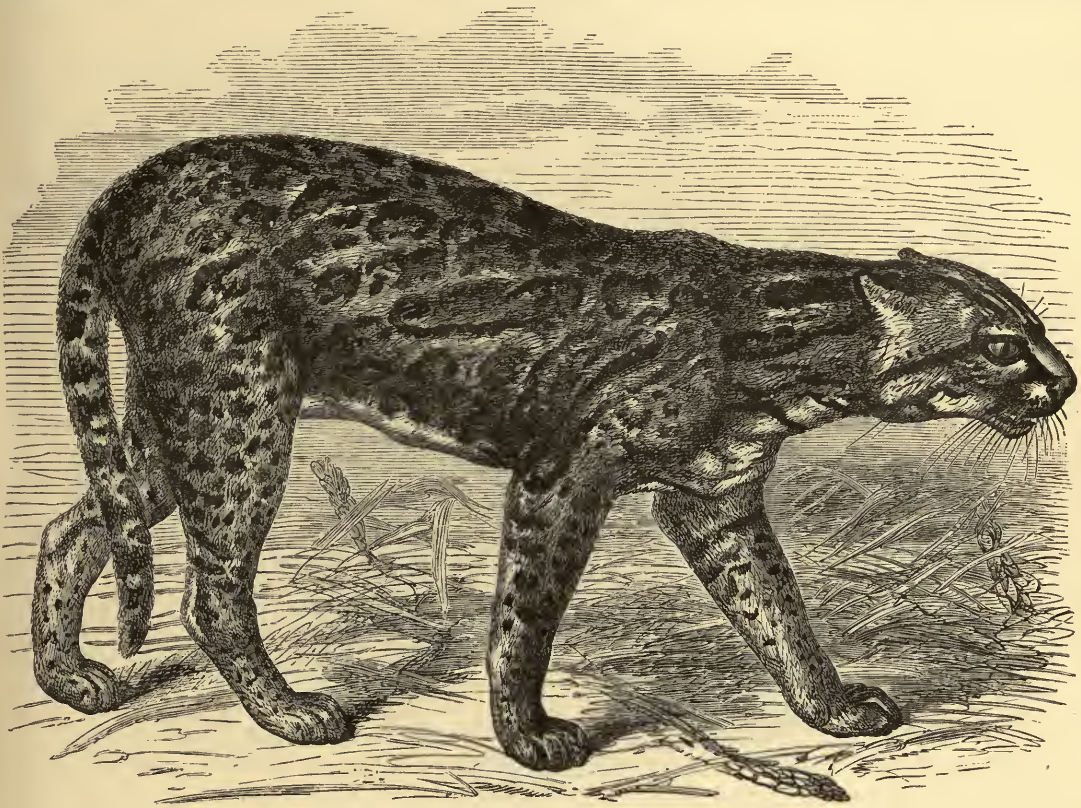


CLOUDED TIGER.

"Both specimens above mentioned, while in a state of confinement, were remarkable for good temper and playfulness; no domestic kitten could be more so. They were always courting intercourse with persons passing by, and in the expression of their countenance, which was always open and smiling, showed the greatest delight when noticed, throwing themselves on their backs, and delighting in being tickled and rubbed. On board the ship there was a small Musi Dog, who used to play round the cage and with the animal, and it was amusing to observe the playfulness and tenderness with which the latter came in contact with his inferior-sized companion. When fed with a fowl that had died, he seized the prey, and after sucking the blood and tearing it a little, he amused himself for hours in throwing it about and jumping after it in the manner that a Cat plays with a Mouse before it is quite dead. He never seemed to look on man or children as prey, but as companions, and the natives assert that when wild they live principally on poultry, birds, and the smaller kind of deer. They are not found in numbers, and may be considered rather a rare animal, even in the southern part of Sumatra. Both specimens were procured from the interior of Bencoolen, on the banks of the Bencoolen River. They are generally found in the vicinity of villages, and are not dreaded by the natives, except as far as they may destroy their poultry. The natives assert that they sleep and often lie in wait for their prey on trees; and from this circumstance they derive the name of *Dahan*, which signifies the fork formed by the branch of a tree, across which they are said to rest, and occasionally stretch themselves.

"Both specimens constantly amused themselves in frequently jumping and clinging to the top of their cage, and throwing a somerset, or twisting themselves round in the manner of a Squirrel when confined, the tail being extended and showing to great advantage when so expanded."

Besides the localities we have mentioned, the Clouded Tiger is described by Consul Swinhoe as existing in Hainan, and he gives a curious quotation respecting the animal from a native paper, the *Hainan Gazetteer*:—"Pao, or Leopard, resembling a Tiger in form, with white fur and round head. Those with spots like cash (Chinese coin) are called the 'Golden-cash Leopard' (*Felis pardus*). Those with spots shaped like the mint-leaf are called Mint Leopard (*F. macrocelis*). They dread Snakes. Hwai Nantzse has the following couplet:—'Snakes command the Leopard to stand: all creatures have their masters.'"



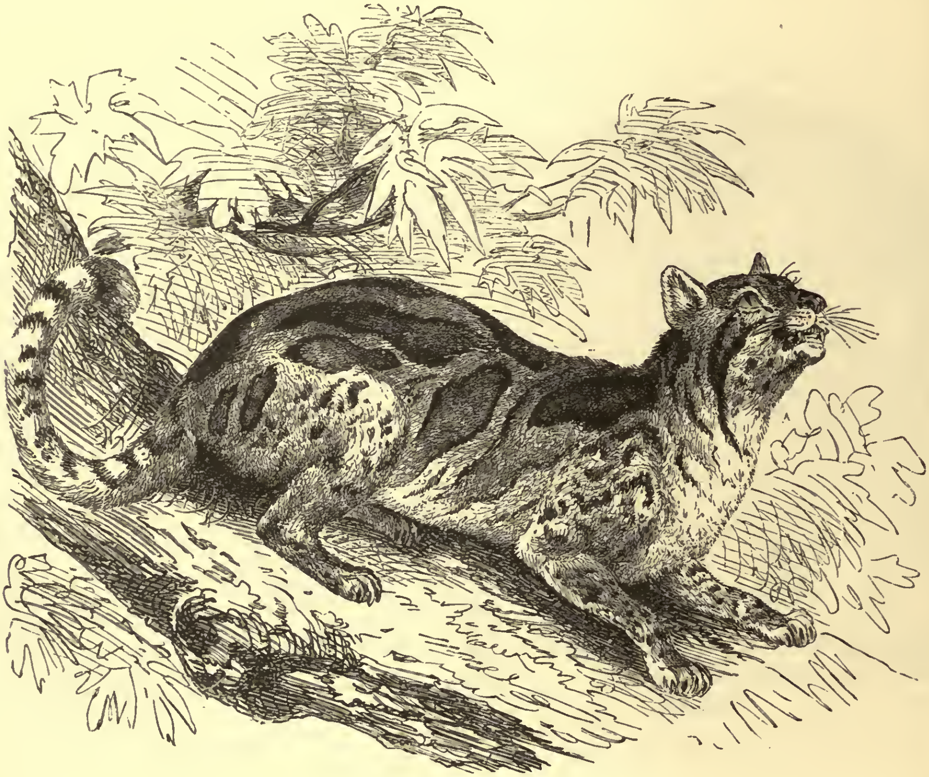
OCELOT.

There was in 1876 a fine specimen in the Zoological Gardens, but it was not always to be seen, as it was kept during the day fastened up in one of the little sleeping apartments at the back of a cage in the Lion-house, and was let out only for about half an hour before the Gardens closed. It was well worth stopping to see. As soon as the iron door of its cell was raised, it would come out into the large cage with a peculiarly sailor-like slouch, for owing to the shortness of its legs its gait was quite different to that of an ordinary Cat, and altogether less elegant. The expression of the face, too, was neither savage, nor majestic, nor intelligent, but rather dull and stupid. It was fond of assuming all sorts of queer attitudes. Brehm describes one as lying prone on a thick branch placed in its cage, with all four legs hanging down straight, two on each side of the branch, certainly a remarkable position for an animal to assume of its own free will.

THE OCELOT.*

This extremely beautiful Cat (see previous page) is, like the Jaguar and the Ounce, a native of America, where it is found throughout the central part of the Continent, from Mexico and Texas on the north, to the northern boundaries of Brazil on the south. Its musical name was coined by Buffon as an abbreviation of its native Mexican appellation Tlalocelotl.

The grey or tawny skin is marked by broadly-sweeping rows of longitudinally elongated spots of large size, each consisting of a black rim enclosing an area somewhat darker than the general ground tint. The head is also beautifully striped, and the tail ringed with black. Altogether, the Ocelot is, in the matter of markings, second only to the Clouded Tiger. It is about four feet long from the snout to the tip of the tail, and its legs are rather short for its size.



MARBLED TIGER-CAT.

"It is a very voracious animal, but at the same time timid. It rarely attacks men. It is afraid of Dogs, and when pursued it makes off to the woods and climbs a tree. There it remains, and even takes up its abode to sleep and look out for game and cattle, upon which it darts as soon as they are within range. It prefers the blood to the flesh, and, in consequence, destroys a vast number of animals, for instead of devouring them, it only quenches its thirst by sucking their blood."†

Notwithstanding its cowardice, the Ocelot is a very savage animal. Buffon mentions a pair of young ones in captivity, which, at the age of three months, were sufficiently strong and cruel to kill and devour a bitch who had been given them as a nurse. He further adds the curious fact, that the male always kept the female in wonderful subjection, so much so, that she was afraid even to attempt to eat until he was completely satisfied.

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* *Felis pardalis.*

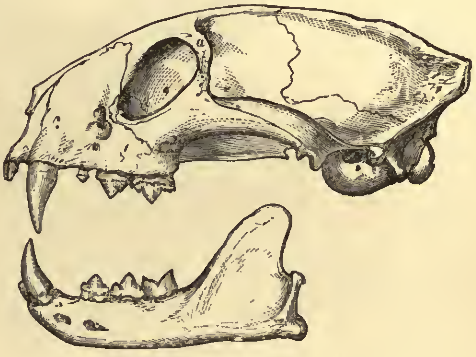
† Buffon.

THE MARBLED TIGER-CAT.*

"This prettily-marked Wild Cat (see previous page) has been found in the Sikkim Himalayas, in the hilly regions of Assam, Burmah, and Malaysia. extending into the islands of Java, at all events." The head and body together are from eighteen and a half to twenty-three inches long, the tail fourteen to fifteen and a half inches. The ground-colour of its hide is of a dingy tawny, "occasionally yellowish-grey, the body with numerous elongate wavy, black spots, somewhat clouded or marbled." The tail is spotted and tipped with black, and the belly is yellowish-white.

THE VIVERRINE CAT. †

"This large Tiger-Cat," says Mr. Jerdon, "is found throughout Bengal, up to the first of the South-eastern Himalayas, extending into Burmah, China, and Malaysia. I have not heard of its occurrence in Central India, nor in the Carnatic; but it is tolerably common in Travancore and Ceylon, extending up the Malabar coast as far as Mangalore. I have had one killed close to my house at Tellicherry. In Bengal it inhabits low, watery situations chiefly, and I have often got it upon the edge of swampy thickets in Purneah. It is said to be common in the Terai and marshy regions at the foot of the Himalayas, but apparently not extending further west than Nepaul. Buchanan Hamilton remarks, 'In the neighbourhood of Calcutta it would seem to be common. It frequents reeds near water; and, besides fish, preys upon *Ampullinæ*, *Unios* (shell-fish), and various birds. It is a furious untamable creature, remarkably beautiful, but has a very disagreeable smell.' On this Mr. Blyth observes, 'I have not remarked the latter, though I have had several big toms quite tame, and even found this to be a particularly tamable species. A newly-caught male killed a tame young Leopardess of mine about double his size.' The Rev. Mr. Baker, writing of its habits in Malabar, says that it often kills Pariah Dogs; and that he has known instances of slave children (infants) being taken from their huts by this Cat; also young calves."



SKULL OF VIVERRINE CAT.
a. The bony bar formed by the union of the frontal and jugal bones which complete the orbit behind.

Notwithstanding its ferocity this is by no means a large animal, being only thirty to forty-four inches long, without the tail, which is ten and a half to twelve and a half inches in length. "The ears are rather small and blunt; the pupil circular; the fur coarse and without any gloss; the limbs short and very strong." The snout is narrow, and drawn out like that of a Civet, hence the name *Viverrina*. The colour is grey, lighter beneath, and banded and spotted with black. There is a very noticeable peculiarity in the skull, from the fact that the orbit, or bony cavity in which the eye is lodged, is completed behind by bone, a character quite exceptional among Cats, and indeed among Carnivora generally.

A very fine specimen was brought over by the Prince of Wales after his visit to India, and deposited in the Zoological Gardens in Regent's Park.

THE PAMPAS CAT. ‡

This animal, as its name implies, is found on the Pampas of South America, extending as far south as the Strait of Magellan, and being especially abundant in the region of the Rio Negro. It is about forty inches long, with a shortish tail and long fur; the hairs, indeed, sometimes attain a length of four or five inches. "The colour of the skin is a pale yellowish-grey, traversed by regularly disposed yellow or brown bands, which run obliquely from the back and the flanks. The hairs, considered separately, are brown at the root, then yellow, and finally black at the point, but those of the hinder part of the back are black at the root, then grey, then yellowish-white, and finally white up to the point, which is black."

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* *Felis marmorata.* † *Felis viverrina.* ‡ *Felis pajeros.*

The Pampas Cat is a comparatively harmless beast, not preying upon poultry-yards, but confining itself to the small Mammals which abound in the South American steppes.

THE LONG-TAILED TIGER-CAT.*

This little-known form—the "Oceloid Leopard" as it is sometimes called—was discovered by Prince Maximilian of Neuwied, in Brazil, where it inhabits the great forests, and is often killed for the sake of its beautiful fur. In colour it is not unlike the Ocelot, in size it is inferior to it, and its longitudinally elongated spots are neither so large nor so well marked. It is chiefly distinguished from other forms by its long bushy tail, and its big staring eyes. It is considerably smaller than the preceding species, the body being about twenty-seven inches long, the tail fourteen.

LONG-TAILED TIGER-CAT.

THE MARGAY.†

This is also an American species, being found in Brazil and Guiana, where it is often known as the "Tiger-Cat." It is much smaller than the Ocelot—little larger than the Domestic Cat, in fact—the body being about twenty-three inches long, and the tail thirteen, and resembles the Ocelot in general appearance (see next page). Its spots are, however, smaller, and more regularly arranged, so that it is by no means so handsome an animal as *F. pardalis.*

It lives in the woods, and destroys an immense amount of small game and birds. It is a savage beast, but is capable of domestication, and may be put to good use as a mouser; it can never, however, be quite trusted, and always keeps up a more or less ferocious appearance. Still, it must be remembered that, in common with a large proportion of the wild *Felidæ*, it has never had a fair chance of showing its milder virtues. The Cats, almost without exception, are savage in the extreme, and practically untamable when caught in the adult state, but Mr. Bartlett informs us that there is hardly one of the group that may not be thoroughly domesticated, if taken young and properly treated.

THE COLOCOLO.‡

This is another Central American Tiger-Cat, of equal ferocity with the last, but far less beautiful. The fur is rougher; the ground-colour is tawny; the spots are smaller than in the Ocelot, and not so exquisitely arranged. The whole body is some forty-one inches long, of which the tail takes up about fourteen.

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* *Felis macrura.* † *Felis tigrina.* ‡ *Felis ferox.*

The Colocolo is an extremely ferocious animal, and does great harm in the forests in which it lives, where, amongst other things, it feeds largely on Monkeys. "On the banks of a river in Guiana, an officer, having killed one of these Cats, stuffed it, and placed it to dry in the hinder part of the boat in which he was travelling. One day they passed under some great trees, the branches of which, hanging into the water, formed a resting-place for innumerable Monkeys, which approached the boat with great curiosity, and seemed to take pleasure in following it as far as the trees would permit. On this particular voyage, the Monkeys ran towards the boat as usual, but the sight of the stuffed fur inspired them with such terror that they precipitately took flight, uttering cries of rage and terror. This observation shows clearly enough that Monkeys look upon the Colocolo as one of their most terrible enemies." *

MARGAY.

THE JAGUARONDI.†

This is a curious, long-bodied, short-legged animal (see next page), with a body almost as lithe and lissom as a Weasel's. Like the Puma's, its head is small and well shaped, and its tail long; but it is a much smaller animal, not exceeding three feet in length, including the tail. Its colour is a dark grey-brown, "each hair being greyish-black, very dark at the root, and entirely black between the root and the point, which is of a dark-grey hue. This diversity of colour causes the Jaguarondi to appear darker or lighter according to circumstances," that is, according to whether, being in a placid condition, his hair is lying smooth and flat on the body, or whether, being excited, he erects it.

The Jaguarondi lives in the thick forests of Brazil, Paraguay, and Guiana, where it always prefers the most impenetrable thickets, and is never seen in the open country. It lives upon birds and small Mammals, having a special fondness for fowls, which no amount of training will ever diminish. Even when a domesticated Jaguarondi is chained up in a yard, it will "try a thousand shifts" to entice the fowls into its neighbourhood, and will then suddenly leap on and devour them.

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* Brehm.

† *Felis jaguarondi.*

THE EYRA.*

This is by far the most beautiful of all the smaller one-coloured Cats (see next page). The beauty of its rich chestnut hide, and the extreme elegance of its form, quite incline one to assign to it the palm for beauty, even in presence of such splendidly-marked forms as the Ocelot. The specimen in the London Zoological Gardens is a most delightful animal. It is slightly smaller than an ordinary Cat, and much less in height, owing to the shortness of its legs, in comparison with which the body is of great length; so that one at first sight instinctively compares it with a Weasel, to which, however, it has really no relationship whatever. Its neck is long, its head small, and curiously flattened from above downwards, almost like an Otter's, and its tail long and well shaped. Its movements are almost Snake-like, so continuously does it twist and turn its long lithe body. In its sanguinary habits and mode of life it does not differ in any important respect from the Jaguarondi, with which it also agrees in its geographical distribution. It is, however, a much rarer animal.

JAGUARONDI.

Mr. Bartlett informs us that he has kept the Eyra in his house, and that it made a most charming pet. Brehm also mentions two domesticated individuals which were on very good terms with the Cats and Dogs in the house, and were particularly friendly with a Monkey, who did them the kind office of catching their fleas.

THE SERVAL.†

The Serval, or African Tiger-Cat, is found over the greater part of Africa, being specially abundant in the south, but extending also as far north as Algeria. It especially frequents the extensive grassy plains or steppes, where it lives upon Antelopes and other game.

Its legs are proportionally much longer and the tail much shorter than those of most of the true

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* *Felis eyra.*

† *Felis serval.*

Cats, in which respects it approaches the Lynxes. It is distinguished from these, however, by the absence of tufts of hair on the ears. The body is about forty inches in length, the tail about sixteen inches. This, it will be seen, by a comparison with the dimensions given of the preceding kinds, shows a much smaller proportion between the tail and the body than in most of the true Cats, but the appendage is never as short as in a Lynx. The ground-colour of the skin is tawny, lighter or darker according to circumstances, and spotted with black. The spots on the flank are all elongated longitudinally, and, along the back, run into distinct bands which are continued on to the forehead. This running together of spots into longitudinal stripes is very common in the Cat tribe. The tail is regularly ringed with black. The fur, although coarse, is handsome, and much used.

EYRA.

THE RUSTY-SPOTTED CAT.*

Mr. Jerdon says, "This very pretty little Cat frequents grass in the dry beds of tanks, brushwood, and occasionally drains in the open country and near villages, and is said not to be a denizen of the jungle. I had a kitten brought over when very young, and it became quite tame, and was the delight and admiration of all who saw it. Its activity was quite marvellous, and it was very playful and elegant in its motions. When it was about eight months old, I introduced it into a room where there was a small fawn of the Gazelle, and the little creature flew at it the moment it saw it, seized it by the nape, and was with difficulty taken off." There is something marvellous in this destroying instinct. This kitten had, probably, never seen a Gazelle before in the whole course of its short life, but it at once recognised its prey, and all the savagery of its long line of ancestors was concentrated in the spring which landed it on the unlucky Gazelle's neck.

The head and body of this species are together sixteen to eighteen inches long; the tail, nine inches and a half. The short, soft fur is a greenish-grey, with a faint rufous tinge, and marked with rusty-coloured spots, roundish on the sides, but, as usual, becoming elongated in the direction of the animal's length, on the back. It is found in the Carnatic, and in the southern parts of Ceylon.

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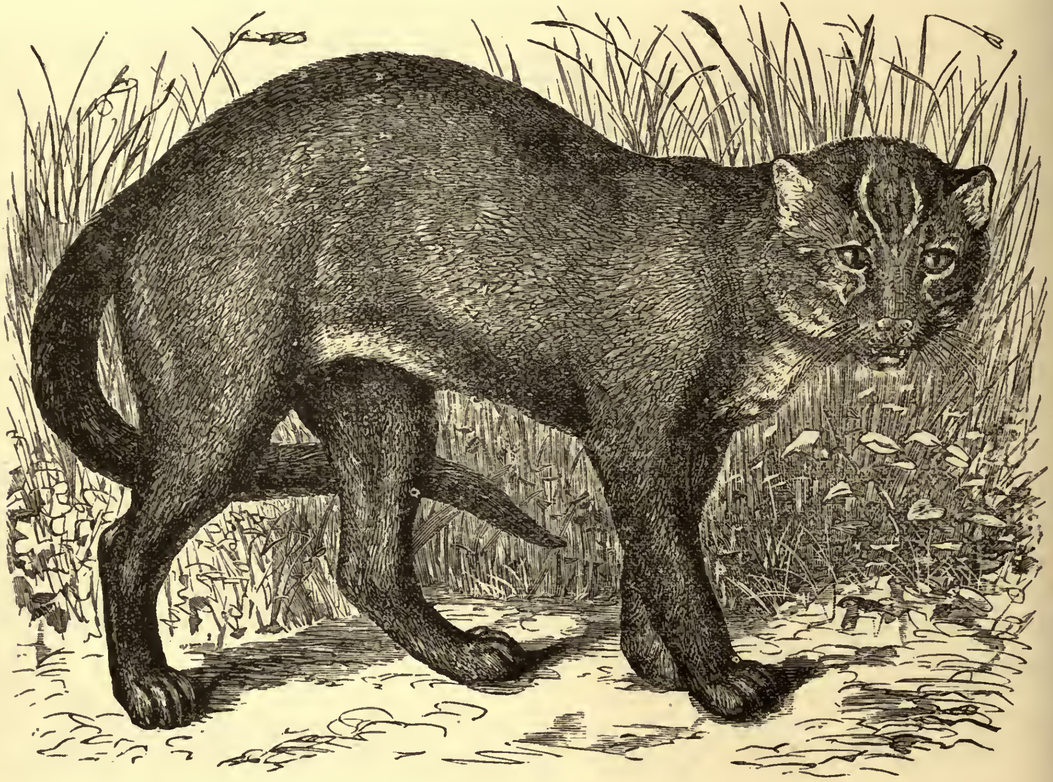
* *Felis rubiginosa.*

THE LEOPARD CAT.*

This is another of the numerous Indian Cats, and is a very beautiful species. Its hide is of a yellowish-grey, or bright tawny hue, quite white below, and marked with longitudinal stripes on the head, shoulders, and back, and with large irregular spots on the sides, which become rounded towards the belly. The tail is a spotted colour, indistinctly ringed towards the tip.. The body, from the end of the snout to the tip of the tail, attains a length of from thirty-five to thirty-nine inches, eleven or twelve of which are made up by the tail.



BAY CAT.

"The Leopard Cat is found throughout the hilly region of India, from the Himalayas to the extreme south, and Ceylon, and in richly-wooded districts, at a low elevation occasionally, or when heavy jungle grass is abundant, mixed with forest and brushwood. It ascends the Himalayas to a considerable elevation, and is said by Hodgson even to occur in Tibet, and is found at the level of the sea in the Bengal Sunderbunds. It extends through Assam, Burmah, the Malayan peninsula, to the islands of Java and Sumatra, at all events." †

It is as fierce as any of its savage kin. "A shikarie declared that it drops on large animals, and even on Deer" (remember that the animal is only two feet long!) "and eats its way into the neck; that the animal in vain endeavours to roll or shake it off, and at last is destroyed." In confinement it is extremely savage, and, curiously enough, "it never paces its cage for exercise during the daytime, at least, but constantly remains crouched in a corner, though awake and vigilant."

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* *Felis bengalensis.*

† Jerdon.

THE BAY CAT.*

This animal (see figure on previous page) is found on the Gold Coast of Africa, as well as in Nepaul, Sumatra, and Borneo. It is of a deep bay-red colour above, becoming paler below: there are a few indistinct dark spots on the hind legs, and the head is splendidly ornamented with stripes of black, white, and orange, offering a striking contrast to the uniform tint of the body, and reminding one strongly of the Tiger. The head and body measure about thirty-one inches, the tail nineteen inches.

Unfortunately nothing is known of the habits of this Cat, so that we can only assume that it has the same savage nature and untamable disposition as the members of its family most nearly allied to it.

THE SPOTTED WILD CAT.†

The habits of this Indian species differ a good deal from those of most Wild Cats, for instead of living in forests and jungles, it frequents "open, sandy plains, where the Field Rat must be its principal food. I hardly ever remember seeing it in what could be called jungle, or even in grass." ‡

It is of a grey colour, spotted with black, and attains a length of sixteen to eighteen inches, not including the tail, which measures ten or eleven inches more. The ears are of a dull-reddish colour, and have a small tuft of hair on the tip, thereby showing a relationship between this Cat and the Lynxes.

THE MANUL.§

The Manul seems to replace the common Wild Cat in Northern Asia, where it occurs on the steppes of Tartary and Siberia. It was discovered by Pallas, who gives no account of its habits.

Its body is twenty-eight, its tail twelve inches long, so that it is about the same length as the Wild Cat; it has, however, longer legs. The skin contains a mixture of yellowish and of white hairs; the head is striped, and the tail ringed with black.

THE EGYPTIAN CAT.||

This is an animal (see figure on next page) of great historic interest, as its remains have been found embalmed in the Egyptian monuments. At the present day it is found in Abyssinia and Egypt.

It is about the size of an average Domestic Cat, but has a longer tail. The general colour is light tawny or yellowish-grey, with dark transverse bands. The tail is tawny above, white below, and ringed only at the termination.

THE COMMON WILD CAT.¶

The Wild Cat exists in "all the wooded countries of Europe, Germany especially, Russia, Hungary, the North of Asia, and Nepaul. This animal is larger in cold climates, and its fur is there held in high estimation. In Britain it was formerly plentiful, and was a beast of chase, as we learn from Richard the Second's Charter to the Abbot of Peterborough, giving him permission to hunt the Hare, Fox, and Wild Cat. The fur in those days does not seem to have been thought of much value, for it is ordained in Archbishop Corboyl's canons, A.D. 1127, that no abbess or nun should use more costly apparel than such as is made of Lambs' or Cats' skins.

"The Wild Cat is now rarely found in the South of England, and even in Cumberland and Westmoreland its numbers are very much reduced. In the North of Scotland and Ireland it is still abundant."

The average length of a full-grown male specimen is, from snout to root of tail, about twenty-eight inches, the tail itself measuring about thirteen inches. The soft thick fur is of a grey colour, inclining to yellowish on the face, and being nearly white on the belly. There is a black band along the middle of the back, from which numerous dark-grey bands proceed in a transverse direction like the hoops of a barrel, gradually dying away as they reach the belly. The thick tail is ringed with grey and black.

"The Wild Cat leads a solitary life; at most, two individuals are seen together. It even appears that the occupant of one district prevents access to it of any others. Its life is completely nocturnal,

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* *Felis aurata.*

† *Felis torquata.*

‡ Scott, quoted by Jerdon.

§ *Felis manul.*

|| *Felis maniculata.*

¶ *Felis catus.*

and has much analogy with that of the Lynx and of our own Domestic Cat. It climbs well, and mounts trees, either as a resting-place, or to escape from an enemy when there is no hole in which it can hide. Under this circumstance it 'plays 'possum' to the best of its ability, keeping close to a large branch, the colour of which, harmonising with that of its skin, contributes to conceal it from view. It does not commence its hunting operations until night has set in; and, in surprising the bird in its nest, the sitting Hare, the Rabbit in its burrow, and even the Squirrel on its tree, it displays a cunning unsurpassed by any of its tribe. When the quarry is a small animal, it leaps on its back and severs its carotids with its sharp teeth. It never pursues an animal which it has failed to reach at the first onslaught, but prefers to go in search of new prey; in a word, it has all the characters of a true Cat.

EGYPTIAN CAT.

Happily for hunters, its principal nutriment consists of Mice and small birds. It is only by accident that it seeks for larger animals; it is, however, certain that it sometimes attacks Fawns or small Roes. It keeps watch by the banks of lakes and streams for fish and birds, both of which it knows full well how to seize. It is extremely destructive in parks, and, above all, in covers, which it utterly depopulates in a very short time. Considering its size, the Wild Cat is a very dangerous Carnivore, its sanguinary nature inciting it to kill far more animals than it can possibly eat. For this reason all hunters detest it, and pursue it with perfect hatred. But no one seems to remember the services it renders to man in destroying small Rodents, and yet these services are undoubted. Tschudi relates that the remains of twenty-six Mice have been found in the stomach of a single individual of this species."*

This interesting account shows how little difference there is between the habits and the nature of this little wild beast of Great Britain and its big cousins of the African and Indian jungles. In its nocturnal habits, its mode of attack, its bloodthirstiness, and its wanton cruelty, it is just the Tiger over again on a small scale, only less harmful because less powerful. Some idea of its immense strength may be gathered from the fact that it is known to have actually killed men.

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* Brehm.

In some places the Wild Cat is regularly hunted, usually in winter, when the tracks in the snow are easily followed. The sport has the necessary element of danger to no ordinary degree, for the terrible little beast, if wounded, makes straight for the hunter, and attacks him with tooth and claw, and such teeth and such claws are by no means pleasant things to be wounded with. On the whole, we have hardly reason to be sorry that the race is almost extinct in Great Britain.

THE DOMESTIC CAT.*

This animal—*the* Cat *par excellence*—is, next to the Dog, the flesh-eater which possesses for us the greatest personal interest, as it is, with the exception of the Dog, almost the only quadruped regularly admitted into the society of man, eating from his hand, drinking from his cup, and being to him, if not a firm friend, like its canine relative, at least a comfortable, contented companion, adding greatly by its look of calm repose and its contented purr to the cosiness of the fireside.

COMMON WILD CAT.

The origin of the Domestic Cat is so far distant that it is quite uncertain from what wild species it was derived. It is not once mentioned in the Bible, a very curious circumstance, as it was well known in Egypt, and it might have been expected that it would be named, with the Dog, among the unclean animals. Cats "are mentioned in a Sanskrit writing 2,000 years old, and in Egypt their antiquity is known to be even greater, as shown by monumental drawings and their mummied bodies." From many circumstances it seems probable that the Cat had, like the Dog, a multiple origin, that is, was produced by the commingling of several wild forms. It is certain that our Domestic Cats will breed freely with many of their feral brethren, such as the Common Wild Cat, the Chaus, Viverrine, and Rusty-spotted Cats, &c.

Wherever the Cat is found as a domesticated animal it is held in great esteem. This feeling was carried to its greatest extent by the ancient Egyptians, whose devotion to their pets was such that, according to Herodotus, when a fire broke out, they cared for nothing but the safety of their Cats, and were terribly afflicted if one of them fell a victim to the flames. On the death of a Cat, the inhabitants of the house shaved off their eyebrows, and the deceased animal was embalmed, and buried with great solemnity in a sacred spot. Many Cat mummies have been found in the Egyptian tombs, and some are to be seen in the British Museum, together with similarly preserved specimens of human beings, and of sacred Calves. Some individuals were wrapped separately in ample bandages covered with inscriptions; others of a less degree of sanctity were preserved in numbers with a single wrapping for several. Their movements and their cries were consulted as oracles, and the murder, or even the accidental felicide of one of them, was punished by death.

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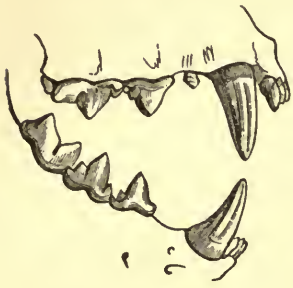
* *Felis domestica.*

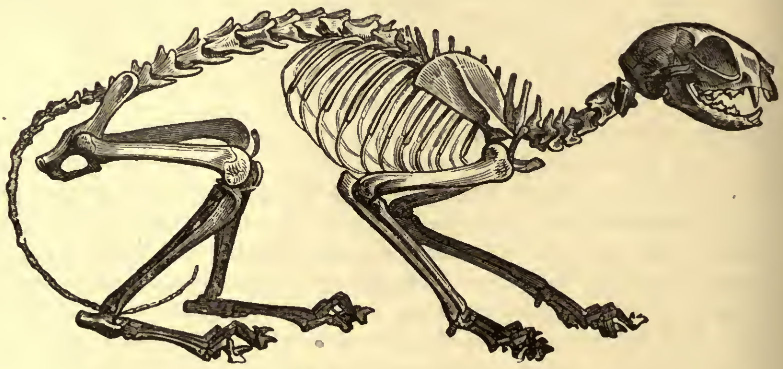


TEETH OF DOMESTIC CAT.

The earliest account of the Cat in Britain is as far back as A.D. 948. "That excellent prince *Howel Dha*, or *Howel the Good*, did not think it beneath him, among his laws relating to the prices, &c., of animals, to include that of the Cat, and to describe the qualities it ought to have. The price of a kitling, before it could see, was to be a penny; till it caught a Mouse, twopence. It was required, besides, that it should be perfect in its senses of hearing and seeing, be a good mouser, have the claws whole, and be a good nurse; but if it failed in any of these qualities, the seller was to forfeit to the buyer the third part of its value. If any one stole or killed the Cat that guarded the prince's granary, he was to forfeit a milch ewe, its fleece, and lamb, or as much wheat as, when poured on the Cat, suspended by its tail (the head touching the floor), would form a heap high enough to cover the tip of the former. This last quotation is not only curious as being an evidence of the simplicity of ancient manners, but it almost proves to demonstration that Cats are not aborigines of these islands, or known to the earliest inhabitants. The large prices set on them, if we consider the high value of specimens at that time, and the great care taken of the improvement and breed of an animal that multiplies so fast, are almost certain proofs of their being little known at that period."* Moreover, as the Wild Cat was abundant in Britain at this or at more recent periods, it is tolerably certain that this species is not the parent of our domestic kinds.

MUMMY OF EGYPTIAN CAT.

Little need be said about the anatomy of the Cat, for it differs but slightly from its larger relatives, and hardly at all from the smaller wild species. The skull is smooth, and has its ridges less developed than in the great beasts of prey; the orbits are very large, and the nose-region is extremely short, and forms a continuous curve with the forehead. Owing to these two latter circumstances the Cat is extremely round-faced, more so, perhaps, than any other species of the genus.



SKELETON OF DOMESTIC CAT.

One curious point of structure is to be found in the intestines, which "are wider, and a third longer, than in Wild Cats of the same size.' There can be little doubt that this has been brought about by the fact that the food of a domesticated flesh-eater is certain to be somewhat miscellaneous, and not of the strictly carnivorous nature preferred by the animal in its wild state.

The varieties in colour exhibited by the Cat are very great, and often kittens in the same litter will differ greatly in this respect. "The normal colour," according to Dr. Gray, "seems to be that of the Tabby Cat, grey, with black dorsal streaks and sub-concentric bands on the sides and thighs; sometimes all black from melanism, or grey, blue, yellow, or white, or these colours more or less mixed. When black, white, and yellow, it is called Tortoiseshell, or Spanish Cat. The fur varies greatly in length; it is very short, close, and almost erect from the skin in the Rabbit Cats. It is very long, silky, and fluffy in the Angora (or Angola) Cat. The tail is usually long. It is very short or almost entirely wanting in the Isle of Man Cats, or the Japan Cats of Kæmpfer. The ears are generally erect; but they are sometimes pendulous in the Chinese Cats."

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* Pennant, "British Zoology."

With regard to the colour of Cats, a very curious circumstance has been observed, namely, that White Cats with blue eyes are nearly always deaf! The only rational explanation of this remarkable phenomenon is that suggested by Mr. Wallace, namely, that the absence of colour in the skin is usually accompanied by a similar absence of pigment elsewhere, and it has been shown that the presence of a peculiar black pigment is very essential to the proper action of the sense organs. To bear out this view it may be stated that *Albinos*—that is, abnormally colourless animals—are usually deficient in taste, smell, and sight.

The eye also varies much in colour, being blue, yellow, or green. The pupil, or small black aperture in the centre of the coloured portion, is extremely sensitive, dilating greatly in the dark, and contracting to a mere line when the light is strong.

We have already mentioned the skin-muscle, or thin band of flesh lying immediately under the skin, and by means of which the shivering of the skin, the erection or rendering vertical of hairs, &c., is performed. The latter effect—an effect seen on a small scale in ourselves as "goose-skin"—is well seen in the Cat, for the animal invariably makes its hair stand on end when it is angry or alarmed, and so makes itself look as large and terrible as possible. In the manner of using this muscle, as well as in many other matters, the Cat resembles in a remarkable degree the great beasts of prey, and forms a capital study of feline expression. Every one must have noticed the instantaneous change in the whole demeanour of a Cat when it catches sight of a strange Dog. This and other characteristic attitudes are well described by Mr. Darwin.*

"When this animal is threatened by a Dog it arches its back in a surprising manner, erects its hair, opens its mouth, and spits." This well-known attitude "is expressive of terror combined with anger. Anger alone is not often seen, but may be observed when two Cats are fighting together; and I have seen it well exhibited by a savage Cat whilst plagued by a boy. The attitude is almost exactly the same as that of a Tiger disturbed, and growling over its food, which every one must have beheld in menageries. The animal assumes a crouching position, with the body extended; and the whole tail, or the tip alone, is lashed or curled from side to side. The hair is not in the least erect. Thus far, the attitude and movements are nearly the same as when the animal is prepared to spring on its prey, and when, no doubt, it feels savage. But when preparing to fight, there is this difference, that the ears are closely pressed backwards; the mouth is partially opened, showing the teeth; the fore-feet are occasionally struck out with protruded claws, and the animal occasionally utters a fierce growl. Let us now look at a Cat in a directly opposite frame of mind, whilst feeling affectionate and caressing her master, and mark how opposite is her attitude in every respect. She now stands upright with her back slightly arched, which makes the hair appear rather rough, but it does not bristle. Her tail, instead of being extended and lashed from side to side, is held quite stiff and perpendicularly upwards; her ears are erect and pointed; her mouth is closed, and she rubs against her master with a purr instead of a growl. Let it further be observed how widely different is the whole bearing of an affectionate Cat from that of a Dog, when, with his body crouching and flexuous, his tail lowered and wagging, and ears depressed, he caresses his master.

"We can understand why the attitude assumed by a Cat when preparing to fight with another Cat, or in any way greatly irritated, is so widely different from that of a Dog approaching another with hostile intentions; for the Cat uses her fore-feet for striking, and this renders a crouching position convenient or necessary. She is also much more accustomed than a Dog to lie concealed and suddenly spring on her prey. No cause can be assigned with certainty for the tail being lashed or curled from with infinitely greater sensibility. Imagine a blind man with not one stick, but a couple of dozen, of exquisite fineness, and these not held in his hand, but embedded in his skin, so that his nerves come into direct contact with them instead of having a layer of skin between, and some notion may be formed of the way in which a Cat uses its whiskers.

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* "Expression of the Emotions in Man and Animals."

But the Cat in its night walks has a further advantage over the blind man, namely, that except on the very darkest nights, it is not entirely deprived of the power of sight, for, as we have already mentioned, the pupil is so constructed that in the dark it can be dilated, so as to catch every available ray of light, and, moreover, the *tapetum*, or brilliant lining of the eyeball, reflects and magnifies the straggling beams, and so enables the Cat, if not actually to "see in the dark," as is sometimes stated, at least to distinguish objects in an amount of light so small as to be inappreciable to our duller vision.

As we have already mentioned, the Domestic Cat is less strictly carnivorous than the wild *Felidæ:* still it prefers meat or milk to anything else, and is by no means a miscellaneous feeder, like the Dog. In the matter of diet, Gilbert White remarks*—"There is a propensity belonging to common house Cats that is very remarkable. I mean their violent fondness for fish, which appears to be their most favourite food; and yet Nature in this instance seems to have implanted in them an appetite that, unassisted, they know not how to gratify; for, of all quadrupeds, Cats are the least disposed towards water, and will not, when they can avoid it, deign to wet a foot, much less to plunge in that element." Mr. White does not seem to have known of the habits of the Jaguar.

A curious instance of the selection of their food by Cats and Dogs is given by the same author:—"As my neighbour was housing a rick, he observed that his Dogs devoured all the little red Mice that they could catch, but rejected the common Mice; and that his Cats ate the common Mice, refusing the red."

This may be partly accounted for by the fact that the little Harvest Mouse has scarcely any trace of the odour which makes the domestic kind disagreeable, and which odour is not disliked, or perhaps is hardly perceived, by the Cat. Both Dogs and Cats, when the corn-ricks are being housed for threshing, will go on helping the farmer and his men for hours, killing Mice by hundreds and by thousands long after they have been satiated by eating them. These Mouse *battues* illustrate the intelligence of the Cat as well as of the Dog, in a quick understanding of what relates to their own interest; for they know immediately what the removal of the thatch from the rick means, and, as it were, scent their prey before it is unearthed. Yet the food-treasures in these ricks are not unknown to the Cats, who night by night for months, perhaps, have caught and regaled themselves upon stragglers from the swarm.

But although of most domestic Cats it may be said,

> "Rats and Mice, and such small deer,
> Have been *Tom's* food for many a year,"

yet, in districts that have the game well "preserved," this sort of diet is often exchanged for that of nobler prey, and the tame Cat will stray for months from the homesteads for young Rabbits, Leverets, and the Partridge covey. This poaching is almost sure to end in death, as these Cats are closely watched by the keepers.

One curious thing about these poaching habits is that they run in families. As Mr. Darwin says, one Cat "naturally takes to catching Rats, and another Mice, and these tendencies are known to be inherited. One Cat, according to Mr. St. John, always brought home game birds, another Hares or Rabbits, and another hunted on marshy ground, and almost nightly caught Woodcocks or Snipes."

A Cat who has once taken to habits like these soon loses her taste for human society and a comfortable fireside, and becomes quite wild and almost as untamable as one of the actually feral species. Many years ago, in a village where we were then living, a female half-wild Cat made furtive visits to an old and extensive farmstead for the sake of the dove-cot Pigeons, and for the safer rearing of her young. These she would deposit, not in-doors, like our tame, pet Cats, but generally in the fagot-stack, and once in a corner of the thick house-thatch, in which was a labyrinth of passages made by the grey Rat. This Cat would form no friendship with us, but made almost demoniacal demonstrations of her combined hatred and fear. Her swearing and her spitting were accomplishments learned by her kittens as soon as they could see, and no care of ours could tame them.

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* "Natural History of Selborne."

One of the most remarkable things about the Cat is its habit of always burying its excrement, whether solid or liquid. A Cat living in the house is easily trained to leave the premises for this purpose, and will always be found to cover her droppings with earth; but even young, untrained Cats of dirty habits, who cannot be kept from occasionally defiling the house, will invariably try to hide their sin by scraping up cinders, &c., over it, or will, at any rate, make vigorous scratches at the carpet, in their endeavours to get up some of it for the same purpose. How a habit of this sort can have originated in an animal living in the woods, as do all the Cats when in a wild state, is a puzzle.

Like most of the Carnivora, the Cat is a tender and affectionate mother; the care with which she trains her young ones, her anxiety for their comfort, her industry in washing them, are too well known to require remark. So fond is she of her offspring that she will entirely alter her usual habits to regain lost ones. Mr. Hugh Miller, F.G.S., tells us of a Cat belonging to a clergyman in Northumberland, whose kittens were taken from her and given to a miller living at a distance of fully two miles, quite beyond the usual walk of a home-loving puss. The mother, however, although she had never been to the place before, and could by no possibility have known where her kittens were taken, made two successive journeys to the mill, each time bringing back in triumph to the rectory one of her dear ones.

So strong is the maternal instinct in the Cat that she will, if deprived of her own offspring, bestow her affections on animals of a totally different species, on creatures even, which, under ordinary circumstances, she would look upon as her natural and lawful prey. The following is a remarkable instance of this overpowering mother-love:—

"My friend had a little helpless Leveret brought to him, which the servants fed with milk in a spoon, and about the same time his Cat had kittens, which were despatched and buried. The Hare was soon lost, and was supposed to be gone the way of most foundlings, to be killed by some Dog or Cat. However, in about a fortnight, as the master was sitting in his garden in the dusk of evening, he observed his Cat, with tail erect, trotting towards him, and calling, with little, short, inward notes of complacency, such as they use towards their kittens, and something gambolling after, which proved to be the Leveret that the Cat had supported with her milk, and continued to support with great affection."*

Thus was a graminivorous animal nurtured by a carnivorous and predaceous one! Why so cruel and sanguinary a beast as a Cat, of the ferocious genus *Felis*, the *Murium Leo* (Lion of the Mice), as Linnæus calls it, should be affected with any tenderness towards an animal which is its natural prey, is not so easy to determine. This incident is no bad solution of that strange circumstance which grave historians, as well as the poets, assert of exposed children being sometimes nurtured by wild beasts that probably had lost their young. For it is not one whit more marvellous that Romulus and Remus, in their infant state, should be nursed by a she-Wolf, than that a poor little suckling Leveret should be fostered and cherished by a Cat.

White, in his "Observations," has another similar anecdote. "A boy has taken three little young Squirrels in their nest, or eyry, as it is called in these parts. These small creatures he put under the care of a Cat who had lately lost her kittens, and finds that she nurses and suckles them with the same assiduity and affection as if they were her own offspring. This circumstance corroborates my suspicion that the mention of exposed and deserted children being nurtured by female beasts of prey who had lost their young, may not be so improbable an incident as many have supposed; and, therefore, may be a justification of those authors who have gravely mentioned what some have deemed to be a wild and improbable story. So many people went to see the little Squirrels suckled by a Cat, that the foster-mother became jealous of her charge, and in pain for their safety, and therefore hid them over the ceiling, where one died. This circumstance showed her affection for these foundlings, and that she supposed the Squirrels to be her own young."

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* White's "Selborne."

Equally remarkable as an instance of the transference of maternal affection is the tale of the Cat whose kittens were replaced by two out of the five pups belonging to a Spaniel. The Cat brought up her foster children so well, that they were able to run about long before the three left under the charge of their own natural mother. Before long they were removed, and the Cat was inconsolable, until, one day, coming across the Spaniel and her pups, she concluded that the latter were her own lost darlings, and in her eagerness to get them engaged in two successive fights with the Spaniel, in each of which she was victorious, and after each of which she carried away a pup to her own premises, thus getting again, as she thought, her own two children, and the Spaniel being obliged to content herself with one.

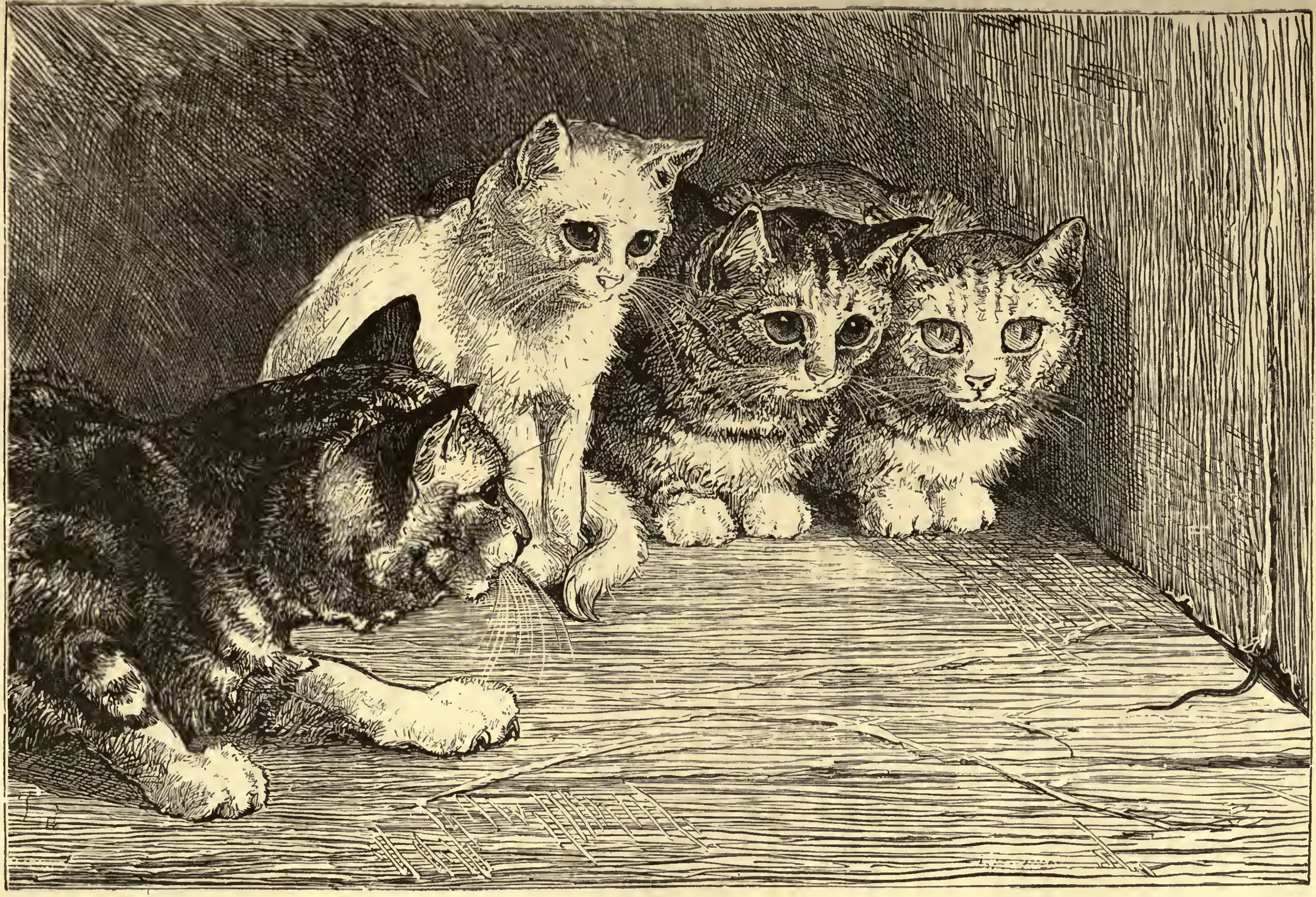
This last anecdote is also remarkable because of the wonderful instinctive antipathy existing between Dogs and Cats, an antipathy which is one of the most curious instances of inherited instinct, for a young kitten, who has never seen a Dog in its life will, on being approached by one, put up its back, and swear and spit with all the force of feline Billingsgate. It is only after living in the same house with a Dog for some time that a Cat will become reconciled to him, but when she once gets to tolerate his presence, the two often become very good friends.

The most astonishing tale we have met with, with respect to their intelligence and sensibility, is one by Mr. C. H. Ross. He states that a Cat in his possession " would climb upon the top of the piano, and, sitting close underneath the picture " of a Bulldog, " fix its eyes upon the Dog's face, and, putting back its ears, remain there, with a wild and terrified expression, for as long as an hour at a time," and this, too, while there were two living Dogs in the house with whom she was on perfectly good terms. This is extraordinary enough, for it is usually stated that animals do not recognise pictures unless they are coloured, and the illustration in question was an engraving. But the queerest part of the story is yet to come. " During the time that he noticed this conduct on the Cat's part, she was with kitten, and when the four kittens were born they were dead, and one of them, strange to say, had a Bull-dog-shaped head, marked almost exactly like the picture ! "

Instances are not wanting in which Cats have formed friendships with birds—creatures which, as a rule, they look upon as their natural prey. One example of an affection of this sort is extremely curious. A Cat and a Canary had acquired a great fondness for one another. The Canary used to perch on the Cat's back and play all sorts of pranks with it. One day their master saw, with horror, the feline Damon rush upon his passerine Pythias and seize it in his mouth. He naturally thought that at last nature had triumphed over grace, but on looking round saw that another Cat had entered the room, to whose tender mercies the bird-lover would by no means trust his little friend.

Like its natural enemy the Dog, the Cat is sometimes afflicted with *rabies*, or madness. Mr. Youatt, a great authority on the subject, says :—" Fortunately for us this does not often occur ; for a mad Cat is a truly ferocious animal. I have seen two cases, one of them to my cost ; yet I am unable to give any satisfactory account of the progress of the disease. The first stage seems to be one of sullenness, and which would probably last to death ; but from that sullenness it is dangerous to rouse the animal. It probably would not, except in the paroxysm of rage, attack any one ; but during that paroxysm it has no fear, nor has its ferocity any bounds.

" A Cat that had been the inhabitant of a nursery, and the playmate of the children, had all at once become sullen and ill-tempered. It had taken refuge in an upper room, and could not be coaxed from the corner in which it had crouched. It was nearly dark when I went. I saw the horrible glare of her eyes, but I could not see so much of her as I wished, and I said that I would call again in the morning. I found the patient on the following day precisely in the same situation and the same attitude, crouched up in a corner, and ready to spring. I was very much interested in the case ; and as I wanted to study the countenance of this demon, for she looked like one, I was foolishly, inexcusably imprudent. I went on my hands and knees, and brought my face nearly on a level with hers, and gazed on those glaring eyes and that horrible countenance, until I seemed to feel the deathly influence of a spell stealing over me. I was not afraid, but every mental and bodily power was, in a manner, suspended. My countenance, perhaps, alarmed her, for she sprang on me, fastened herself on my face, and bit through both my lips. She then darted down-stairs, and, I believe, was never seen again. I always have nitrate of silver in my pocket ; even now I am never without it. I washed myself and applied the caustic with some severity to the wound ; and my medical adviser and valued friend, Mr. Millington, punished me still more after I got home. My object was



DOMESTIC CATS—A STUDY.

attained, although at somewhat too much cost, for the expression of that brute's countenance will never be forgotten."

Except as fur-bearing animals, Cats are made no direct use of, save as Mouse and Rat-catchers. In this capacity they are quite invaluable, for these destructive little Rodents increase and multiply to such an extent, that if it was not for some such check as that afforded by the presence of a good mouser, many places would be as much overrun, and the inhabitants put to as much inconvenience, as were the people amongst whom Dick Whittington's lot was cast. With regard to the number of these plagues of which a single Cat can rid the neighbourhood, it is stated by M. Lenz, as a well-ascertained fact, that a Cat of ordinary size is fully capable of catching and eating twenty Mice a day, or 7,300 a year! Besides Rats and Mice, they are fond of insects, such as Cockroaches; and in some countries, such as Paraguay, they are found to be of great value in killing Serpents, which, however, they are said never to eat, slaying them by repeated dexterous blows of the paw, simply for the sport.

The Domestic Cat is found wherever civilised man exists. It occurs throughout Europe and Asia, and has spread largely in America and Australia since the discovery of these continents by Europeans. The best-marked variety of the species is the beautiful Angora Cat, which is larger than the ordinary Cat, and covered with long fine hair, usually snow-white. The Manx Cat, native only in the Isle of Man, is distinguished by the very remarkable character of being tailless, or, at least, that appendage is quite rudimentary. In other respects, it does not differ from the ordinary varieties. The Persian Cat is a very fine variety often seen in English drawing-rooms; its hair is long, though nothing like so long as that of the Angora. It is a remarkably lazy beast, and far less interesting than the ordinary kind.

The Chinese Cat has also long silky fur and pendent ears, and is regularly fattened and eaten. Mr. Swinhoe gives a curious quotation about this animal from the *Hainan Gazetteer*. "'*Lino*' (or *Domestic Cat*) 'cannot endure Fleas or Lice on its skin. Cats that have nine holes inside the mouth will catch Rats the four seasons through.'" What the Chinese *Gazetteer* means by the *nine holes* is difficult to imagine. Is it not a celestial piece of hyperbole for a Cat with a good large gullet?—just as we speak of their tenacity of life by saying that they have *nine lives*—thus our Cat has nine lives, and the Chinese Rat-catcher has *nine throats*.

CHAPTER V.

CAT FAMILY—HYÆNA FAMILY—CRYPTOPROCTA FAMILY—AARD-WOLF FAMILY.

THE COMMON JUNGLE CAT—THE COMMON LYNX—Historical Sketch—Geographical Distribution—Distinctive Characters—Habits—Uses—THE PARDINE LYNX—THE CANADIAN LYNX—THE RED LYNX—THE CARACAL—THE CHEETAH—Distinctive Characters—Geographical Distribution—Employment in Hunting—THE HYÆNA FAMILY—External Characters—Skull and Teeth—THE SPOTTED HYÆNA—Geographical Distribution—Habits—Laughing Propensities—THE BROWN HYÆNA—THE STRIPED HYÆNA—THE CRYPTOPROCTA FAMILY—Characteristics of the CRYPTOPROCTA—Its Occurrence and Habits—THE AARD-WOLF FAMILY—Characters and Habits of the AARD-WOLF.

THE COMMON JUNGLE CAT.*

THIS, as Mr. Jerdon observes, "is the Common Wild Cat all over India, from the Himalayas to Cape Comorin, and from the level of the sea to 7,000 or 8,000 feet of elevation. It frequents alike jungles and the open country, and is very partial to long grass and reeds, sugar-cane fields, corn-fields, &c. It does much damage to game of all kinds, Hares, Partridges, &c., and quite recently I shot a Peafowl at the edge of a sugar-cane field, when one of these Cats sprang out, seized the Peafowl, and, after a short struggle (for the bird was not dead), carried it off before my astonished eyes, and, in spite of my running up, made good his escape with his booty. It must have been stalking these very birds, so immediately did its spring follow my shot." Besides being so common in India, the Chaus is found all over Africa, especially in the north.

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* *Felis chaus.*

It is of a yellowish-grey colour, inclining to reddish in some parts, and white below. The muzzle and the limbs have dark stripes, and the tail is more or less ringed with black, but the greater part of the body is unspotted. It is interesting to notice that the annulation of the tail is most distinct in the young. We have elsewhere remarked that the young of all the one-coloured Cats (Lion, Puma, &c.), are more or less indistinctly spotted or striped. The ears are slightly tufted, so that this species, like the Spotted Wild Cat, approaches the Lynxes. The length of the head and body together is twenty-six inches; of the tail, nine or ten; the height at the shoulder fourteen or fifteen. A black variety is to be met with in some parts of India.

THE COMMON LYNX.*

In the Lynx we come again to an animal of historical interest, for this creature was well known to the ancients. It is mentioned by Pliny as having first appeared in the Amphitheatre at Rome in the time of Pompey, having been brought to the great city from Gaul, where, at that time, it was probably very abundant. No doubt it would cause grand sport in the arena, for it is an extremely savage beast, and capable of holding its own against animals many times its own size. The Lynx was also one of the animals sacred to Bacchus, and is sometimes represented, instead of the Leopard, as drawing the car of this deity.

But the Lynx of the ancients has, as Buffon remarks, quite the character of a fabulous animal. It was supposed "that its sight was so piercing as to penetrate opaque bodies, that its water had the marvellous property of becoming a solid body, a precious stone, called *lapis lyncurius!*" This last legend, as Brehm suggests, probably arose from the fact that the amber brought from Liguria was called *lapis ligurius,* and that the Greek merchants, knowing nothing about such a place as Liguria, corrupted *ligurius* into *lyncurius,* and, of course, connected it with *Lyncus.* A survival of the superstition about the Lynx being able to see through walls still exists in our common expression, "Lynx-eyed."

The Common Lynx is found chiefly in Norway, Sweden, Russia, and Northern Asia, and in the mountainous districts of Central Europe. In other parts of the Continent it is nearly or quite extinct.

The animal attains a much greater size than any of the ordinary Wild Cats, being as much as forty or fifty inches long, from the tip of its snout to the root of its tail. It is also readily distinguished from the Cats proper by the shortness of its tail, which does not exceed six to nine inches, or about one-fifth the length of the body, and by the length of its legs, which gives it a decidedly un-Cat-like look, and brings its height at the shoulder up to twenty-five inches. Another distinguishing feature is to be found in the long pointed ears, each with a tuft of long stiff hair on its tip; and still another is the length of the fur on the cheeks, whereby a pair of capital whiskers of almost Dundreary length is produced. These, it must be understood, are quite distinct from the true "whiskers," or tactile vibrissæ, with which the upper lip of the Lynx, like that of all *Felidæ,* is provided. The tufted ears and bearded cheeks, together with the fierce brightness of the eye, give the Lynx an altogether peculiar and somewhat weird expression.

When we have added that the pads of the feet are overgrown with hair, we have mentioned all the obvious differences between a Lynx and a true Cat. In everything else, its teeth, its bones, its sheathed claws, its manner of killing its prey, its habit of swearing and spitting when angry, it is a Cat all over. Still, the differences between it and the ordinary Cats are considerable, and some naturalists prefer to look upon the Lynxes as a distinct genus (*Lyncus*); but, on the whole, especially when we consider how the chasm is bridged over by the Jungle Cat, it is more convenient to keep the two together, and consider the Lynxes as simply a section of the great genus *Felis.*

The skin of the Common Lynx is of a reddish-grey colour, more or less spotted with red or dark grey; but the variations in marking are very great in different individuals, and in the same individual at different ages. The fur, also, is longer in winter than in summer.

The Lynx is undoubtedly the most dangerous and destructive beast of prey now left in Europe;

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* *Felis lynx.*

at any rate, a single Lynx will do more damage than an individual of any other wild species. The Russian Wolves may be, on the whole, worse enemies, but they hunt in packs, and are only dangerous in numbers, a single Wolf being a sorry coward, while a Lynx is a truly redoubtable antagonist, as the following excellent account of his habits will show :—

COMMON LYNX.

"While he succeeds in finding food in the forests and gorges of the high mountains, he does not attempt to shift his quarters, but lives alone with his mate, and betrays his presence by horrible howlings, audible at a great distance. He only quits his chosen solitude at the last extremity, and mounts on a branch, where he crouches at full length among the foliage, which half hides without incommoding him. With eye and ear on the watch, he remains whole days motionless, with eyes half closed, and in a state of apparent sleep, which is only the more dangerous, for then he is most completely cognisant of all that is passing around him. The Lynx lives by stratagem. Like all Cats, he has not a particularly fine sense of smell, and his pace is not sufficiently rapid to allow him to pursue his prey. His patience, and the skill with which he creeps noiselessly, bring him close up to his victim. More patient than the Fox, he is less cunning; less hardy than the Wolf, he leaps better and can resist famine longer. He is not so strong as the Bear, but keeps a better look-out, and has sharper sight. His strength resides chiefly in his feet, jaws, and neck. He prefers to make his hunting as easy as possible, and only chooses his victim when food abounds. Every animal he can reach with one of his bounds, which rarely miss their aim, is lost and devoured; if he misses, he allows the animal to escape, and returns to crouch in his post of observation, without showing his disappointment. He is not voracious, but he loves warm blood, and this passion makes him imprudent . . . . If he comes upon a flock of Goats or Sheep, he approaches, dragging his belly along the ground, like a Snake, then raises himself with a bound, falls on the back of his victim, breaks its neck or cuts its carotid with his teeth, and kills it instantaneously. Then he licks the blood which flows from the wound, rips open the belly, devours the entrails, gnaws off a part of the head, neck, and shoulder, and leaves the rest."* So bloodthirsty is his nature, that a single individual has been known to destroy forty Sheep in a few weeks. Fortunately for the inhabitants, this plague is now nearly extinct in Central Europe. It is extremely rare in the Alps, though it was

CANADIAN LYNX.

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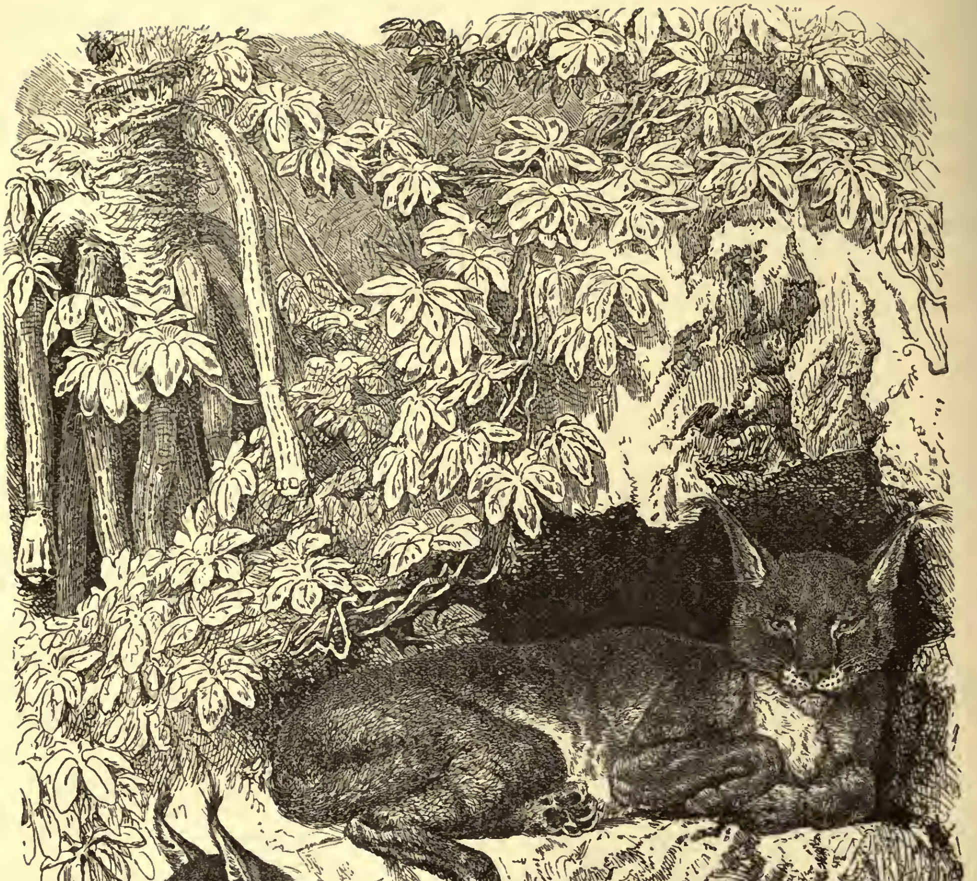
* Tschudi, quoted by Brehm.



CARACAL.

tolerably common within the last fifty years; and in the forests of Thuringia, only two have been found during the present century.

The Lynx, when caught young, is said to be quite tameable, but the domesticated animal is liable to die of over-fatness. Its flesh is eaten in Siberia, and even in Switzerland, but as usual with its tribe, the skin is the part on which the greatest value is set. It has a very beautiful hide, and in Siberia, where the greatest value is obtained, each one costs from twenty to fifty francs on the spot. "The skin of the fore-feet is sold separately; they are cut off, and fetch from ten to fifteen francs a pair. A Lynx skin is worth three of the Sable, six of the Wolf, twelve of the Fox, and a hundred of the Squirrel."

There are some differences as to size, &c., between the Lynxes found in Scandinavia and those inhabiting Central Europe. These are sometimes separated as distinct species, the former being then called *Felis borealis*, the other *F. cervaria;* the latter is the larger of the two.

THE PARDINE LYNX.*

This animal takes the place of the common kind in Southern Europe, being especially abundant in Spain, where its range just overlaps that of its relative.

It is somewhat smaller than the Common Lynx—not more than thirty-two inches long. Its skin is of a beautiful rufous tint, regularly spotted with black, the spots extending over the tail, and the red colour merging into white on the under surface.

THE CANADIAN LYNX.†

This species (see figure, p. 73) replaces the European variety in North America, where it is especially abundant in the Rocky Mountains and in Canada.

It is about the same size as the Common Lynx. Its fur is shorter but thicker. The hairs on the back are darker, the points being ringed with grey and brown; those of the flanks are grey at the root, reddish-white at the extremity. It has the reputation of being a very lazy beast, and far less ferocious and more cowardly than its cousins of the Old World.

THE RED LYNX.‡

The Red Lynx is found in the United States, from the Pacific to the Atlantic. It differs but little in structure or habit from the species we have already described.

Its skin, as well as that of the Canadian kind, is a very important article of commerce.

THE CARACAL.§

This is the handsomest of the Lynxes (see figure on previous page), both on account of its elegant shape, and of its fine colour, which is a uniform reddish-brown or light chestnut, unspotted or very sparsely spotted in the adult, but showing distinct spots in the young. It is found in India, Persia, Arabia, and Tibet, and also throughout Africa. Its length varies from twenty-six to thirty inches, the tail measures nine or ten, and the height sixteen or eighteen inches. The ears are fully three inches long, black externally, white within, with a long dark ear-tuft.

Unlike the other Lynxes, the Caracal is made use of as a hunting animal, being occasionally trained to stalk the Peafowl, Hares, Kites, Crows, Cranes, &c. It is, however, a most savage animal in captivity. The specimen in the London Zoological Gardens seems to be in a permanent state of ill-temper. If the American Lynx, which is unfortunate enough to live in the same cage with him, dares to come "betwixt the wind and his nobility," or even if he, in the course of his peregrinations, should by chance get sufficiently near his companion to be annoyed with the sight of so vulgar a beast, he immediately arches his back, lays back his ears, uncovers his great canines, and swears in the most fearful manner, until the other unlucky animal is quite cowed, and looks as meek as its feline nature will allow it, evidently deprecating the anger of my lord, and although not conscious of having done wrong, quite ready to promise faithfully never to do it again.

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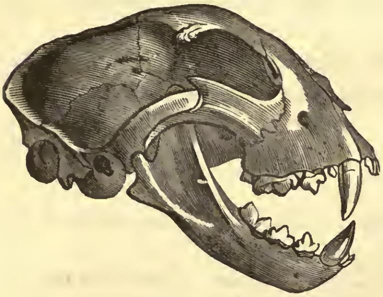
* *Felis pardina.* † *Felis canadensis.* ‡ *Felis rufa.* § *Felis caracal.*

THE CHEETAH.*

The Hunting Leopard, or Cheetah, is the last member of the Cat family, and is distinguished from the foregoing forms of the group by its long legs, the peculiar form of the flesh tooth of the upper jaw, and by the fact that its claws are less perfectly retractile than those of other cats, owing to the excessive length of the elastic ligaments. So much struck have some observers been with the variation of the Cheetah from the ordinary feline type, that it has been named *Cynœlurus*, or Dog-Cat, a very inappropriate name, as the animal is a Cat all over, as any one will see who will take the trouble to look at the specimens in the Zoological Gardens. No Dog has that round face, long tail, and supercilious, almost arrogant, expression.

The Cheetah is about four feet and half long from tip of snout to root of tail. The latter appendage is two feet and a half in length, and the height of the animal at the shoulder two feet and a half to two and three-quarters. The hide is of a bright reddish fawn-colour, and covered with numerous black spots, which are single, and not arrayed in rosettes, as in the Leopard, Jaguar, Ocelot, &c. The appearance of the face is very characteristic, owing to a black stripe which passes down the cheek in a sort of sigmoid curve, from the corner of the eye to the angle of the mouth. The tail has black spots and a black tip. The body is slender and small in the loins like a Greyhound's.


SKULL OF CHEETAH.

There are three varieties of this animal. One, the maneless Cheetah, is confined to Africa; another, the maned Cheetah, is found all over South-west Asia, and is distinguished from the first-named variety by its longer hair, and by the presence of a distinct though short mane, which, however, is more like the cheek-tufts (we must not call them whiskers, though they exactly resemble them, as that name is appropriated to the long vibrissæ) of the Tiger or Lynx than the mane of the Lion. The third variety is the woolly Cheetah, which differs so much from the other two, as to be usually separated as a distinct species (*Felis lanea*). Its hair is woolly, and the spots and face-mark light brown instead of black. The hind legs are unusually short. It is a native of South Africa.

Mr. Jerdon says, that "this animal was the original *Panther* and *Leopardus* of the ancients, who considered (with the Arabs of the present day in North Africa) that it was a breed between the Lion and the Pard." Possibly it was this animal to which Jeremiah alluded, when he said, "Can the Ethiopian change his skin, or the *Leopard* his spots?" For, although rare, it is still found in Palestine. Canon Tristram says, "A few still haunt the neighbourhood of Tabor and the hills of Galilee. In Gilead it is more common, and a sheikh there presented me with three skins of the Cheetah, shot by his people."

It frequents open plains, and hunts by day, in correspondence with which habits it has a circular and not an elliptical pupil to the eye.

The Cheetah is a half-domesticated animal; we say half-domesticated, because, although it is used regularly in hunting, yet it is never properly tamed, and always has to be, as it were, *gulled* into doing its work. The following account of the manner in which it is used in Indian sport is given by Mr. Jerdon†:—

"'On a hunting party,' says Buchanan Hamilton, 'the Cheetah is carried on a cart, hooded, and when the game is raised the hood is taken off. The Cheetah then leaps down, sometimes on the opposite side to its prey, and pursues the Antelope. If the latter is near the cart, the Cheetah springs forward with a surpassing velocity, perhaps exceeding that which any other quadruped possesses. This great velocity is not unlike the sudden spring by which the Tiger seizes its prey, but it is often continued for three or four hundred yards. If within this distance the Cheetah does not seize its prey, he stops, but apparently more from anger or disappointment than from fatigue, for his attitude is fierce, and he has been known immediately afterwards to pursue with equal rapidity another Antelope that happened to be passing. If the game is at too great a distance when the Cheetah's eyes are uncovered, he generally gallops after it, until it approaches so near that he can seize it by a rapid spring. This gallop is as quick as the course of well-mounted horsemen. Sometimes, but rarely, the Cheetah endeavours to approach the game by stealth, and goes round a hill or rock until he can come upon it by surprise. This account of the manner of hunting I collected from the conversation of Sir Arthur Wellesley, who, while commanding officer at Seringapatam, kept five Cheetahs that formerly belonged to Tippoo Sultan.' Mr. Vigne writes thus :—'The hunting with Cheetahs has often been described, but it requires strong epithets to give an idea of the creature's speed. When slipped from the cart, he first walks towards the Antelope with his tail straightened, and slightly raised, the hackle on his shoulder erect, his head depressed, and his eyes intently fixed upon the poor animal, who does not yet perceive him. As the Antelope moves, he does the same, first trotting, then cantering after him; and when the prey starts off, the Cheetah makes a rush, to which (at least I thought so) the speed of a racehorse was, for the moment, much inferior. The Cheetahs that bound or spring upon their prey are not much esteemed, as they are too cunning. The good ones fairly run it down. When we consider that no English Greyhound ever yet, I believe, fairly ran into a doe Antelope, which is faster than the buck, some idea may be formed of the strides and velocity of an animal who usually closes with her immediately, but fortunately cannot draw a second breath, and, consequently, unless he strike the Antelope down at once, is obliged instantly to stop and give up the chase. He then walks about for three or four minutes in a towering passion, after which he again submits to be helped on the cart. He always singles out the biggest buck from the herd, and holds him by the throat until he is disabled, keeping one paw over the horns to prevent injury to himself. The doe he seizes in the same manner, but is careless of the position in which he may hold her.' The natives assert that (in the wild state) if the ground is not very favourable for his approaching them without being seen, he makes a circuit to the place where he thinks they will pass over, and if there is not grass enough to cover him, he scrapes up the earth all round, and lies flat until they approach so near that by a few bounds he can seize on his prey. Mr. W. Elliott says, 'They are taught always to single

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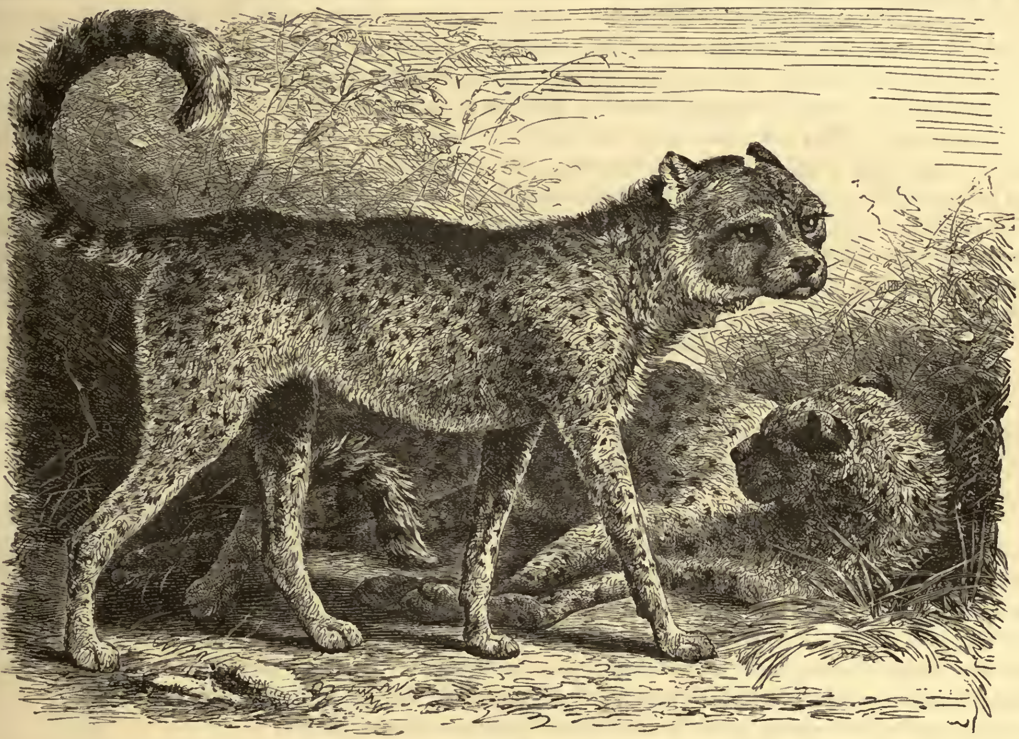
* *Felis jubata.*

† "Mammals of India."



CHEETAH.

out the buck, which is generally the last in the herd. The meer-shikars are unwilling to slip till they get the herd to run across them, when they drive on the cart and unhood the Cheetah.'

"I have only to add to this, on my own testimony, that I have often seen it, when unhooded, at some distance from the Antelope, crouch along the ground and choose any inequality of surface to enable it to get within proper distance of the Antelope. As to Vigne's idea of its rush being made during one breath, I consider it a native one, and unfounded, and I may say the same of its holding one paw over the horns of the buck. The Cheetah, after felling the Antelope, seizes it by the throat, and when the keeper comes up he cuts its throat and collects some of the blood in the wooden ladle from which it is always fed. This is offered to the Cheetah, who drops his hold, and laps it up eagerly, during which the hood is cleverly slipped on again. My tame Cheetah, when hungry or left alone (for it appeared unhappy when away from the Dogs with no one near it), had a plaintive cry, which Blyth appropriately calls a 'bleat-like mew.' Shikaries always assert that if taken as cubs they are useless for training, till they have been taught by their parents how to pull down their prey. This opinion is corroborated, in part at least, by my experiences with the tame one mentioned above."

Although capable of domestication, the Cheetah is, when roused, anything but a pleasant animal to come across. Two colonists from the Cape of Good Hope happened to meet one while they were out shooting Gazelles, and, unfortunately for themselves, pursued it. "The roughness of the road retarded the animal's flight, and a ball reached it. It immediately turned upon the hunter who had wounded it, and, leaping upon him, pulled him from his Horse, and a hand-to-hand conflict began between the two adversaries. The other hunter dismounted and hastened to succour his comrade, at the risk of hitting him as well as the animal from which he wished to deliver him. His shot was badly aimed. The noise of the discharge changed the aspect of the combat, for the Cheetah abandoned the man whom he had thrown down, to fling himself with redoubled fury on the new assailant, who had not even time to draw his hunting-knife. The animal seized him by the head, and, without letting go, rolled with him to the bottom of a ravine. It was of no avail that the first man, left alive, but horribly mutilated, dragged himself to the new battle-field; the wounds of his companion were mortal, and he only had the melancholy satisfaction of giving the *coup de grâce* to the animal, who was already exhausted by loss of blood."

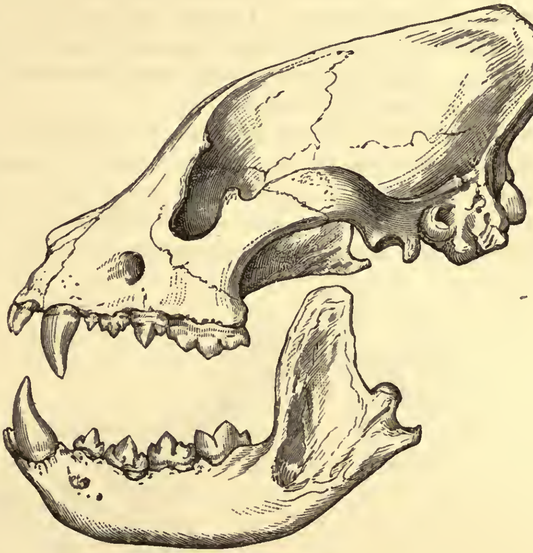
It is curious, considering the constant domestication of this animal in India, that it does not breed at all readily in confinement. In fact, Mr. Bartlett, who probably knows more about the matter than any one, says that it has never to his knowledge bred in England; but Dr. Günther affirms that it has bred in the Gardens in Frankfort.

The young animal is covered with soft brown hair, without spots, a curious fact, quite reversing the usual order of things, for, as we have seen, the young of the Lion, Puma, and other one-coloured Cats, are distinctly spotted. The black mark on the cheek appears first, and then the body spots. Mr. Jerdon gives an interesting account of a Cheetah kitten belonging to him:—

"I brought up the young one above alluded to along with some Greyhound pups, and they soon became excellent friends. Even when nearly full-grown it would play with the Dogs (who did not over relish its bounding at them), and was always sportive and frolicsome. It got much attached to me, at once recognising its name (Billy), and it would follow me on horseback like a Dog, every now and then sitting down for a few seconds, and then racing on after me. It was very fond of being noticed, and used to purr just like a Cat. It used to climb on any high object—the stump of a tree, a stack of hay—and from this elevated perch look all round for some moving object. As it grew up, it took first to attacking some Sheep which I had in the compound, but I cured it of this by a few sound horsewhippings; then it would attack Donkeys, and get well kicked by them; and when not half-grown it flew one day at a full-grown tame Nylghau, and mauled its legs very severely before it could be called off. I had some Chikaras (*Gazella Bennettii*) caught, and let loose before it to train it. The young Cheetah almost always caught them easily, but it wanted address to pull them down, and did not hold them. Occasionally, if the Antelope got too far away, it would give up the chase, but if I then slipped a Greyhound, it would at once follow the Dog and join the chase. It was gradually getting to understand its work better, and had pulled down a well-grown Antelope Fawn, when I parted with it, as I was going on field service."

Brehm had a Cheetah called "Jack," which was so tame that his master led him about like a

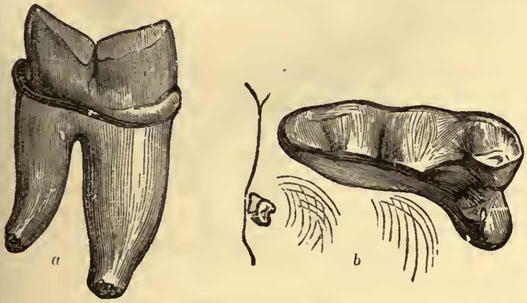
Dog, and even took him into a drawing-room full of ladies, by whom, after they had recovered their fright at seeing a real wild beast enter the room, he allowed himself to be patted and caressed. The same author states that a Cheetah once lived at large in an English seaport, and was the greatest possible favourite with the sailors and other inhabitants.


SKULL OF HYÆNA.

THE HYÆNA FAMILY *

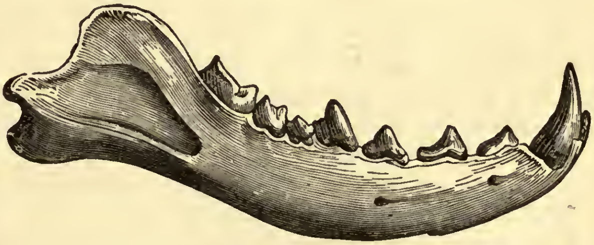
This group contains the single genus *Hyœna*, one species of which, the Striped Hyæna (*H. striata*), inhabits North-east Asia and Northern Africa; the others (*H. crocuta* and *H. brunnea*) inhabiting South Africa.

Externally, the Hyænas have something the appearance of extremely ugly and unattractive-looking Dogs. They are somewhat larger than a Shepherd's Dog, and are covered with coarse bristly hair, short over the greater part of the body, but produced into a sort of mane along the ridge of the neck. The mode of progression is entirely digitigrade, the legs having much the same proportion as in an average Dog, except for the fact that the hind legs are shorter than the fore legs, so that the body slopes from the withers to the haunches. The claws resemble those of the Dog in that they cannot be retracted in sheaths of skin: here, therefore, we have a great and marked difference from all the Cat tribe.



TEETH OF HYÆNA.
a, First lower molar. *b*, Last upper premolar.

The tail is bushy, the snout long, but blunt, giving the beast a snub-nosed appearance and a horridly vulgar expression, quite different to that of most of his relatives. The long-nosedness is partly, however, only a matter of external appearance, for the skull, although nothing like as short as a Cat's, is yet very far from being as long as that of a Dog or a Civet, and it is still more Cat-like in the immense width of the cheek-arches, and the great development of bony ridges for the attachment of muscles. The great longitudinal ridge on the top of the skull is indeed far larger than in even the Lion or Tiger, and forms a great shelving crest, like that of an old-fashioned helmet. As we have already mentioned, this ridge is for the attachment of the great cheek muscles which close the jaw—muscles which, in the Hyæna, are of such power, that the animal's favourite way of attacking Dogs is to bite their legs off, and one of its choicest titbits is the marrow of bones, which can only be obtained by cracking the bone across, as we should crack a nut. Any one who has examined a Horse's or an Antelope's thigh-bone will have some notion of the power of jaws capable of smashing such a tough morsel.


LOWER JAW OF HYÆNA.

But something more is required than strong muscles for work such as this; and the Hyæna is furnished with a set of tools which, when worked by such mighty power, are simply irresistible. The large grinding-teeth, instead of the scissor-blade form they have in the Cats, have great conical crowns, the base of the cone being belted by a strong ridge which defends the subjacent gum (see figure on preceding page). One has only to look at these teeth to see their perfect adaptation to their purpose. Sir Richard Owen remarks, "An eminent civil engineer, to whom I showed the jaw of a Hyæna, observed that the strong conical tooth, with its basal ridge, was a perfect model of a hammer for breaking stones for roads."

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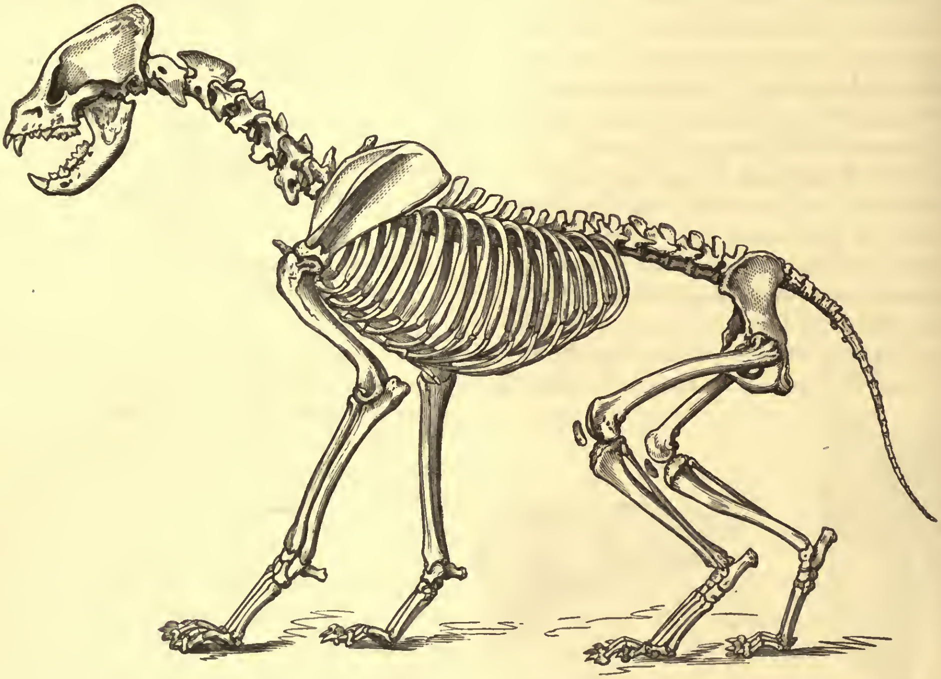
* *Hyœnidœ.*

The canines of the Hyæna are proportionally much smaller than in the *Felidæ*, and the outermost incisor—that nearest the canine—is much larger than in the Cats, so that it approaches towards the canine in size. This, as we shall see, is even more the case in the Dog.

Then, the number of the teeth is different; the Hyæna is a less specialised animal than the Cats, that is, departs less from the average structure of a Mammal, and, in correspondence with this, we find that its jaws are longer and its teeth more numerous; it has, in fact, one more premolar, or false grinder, on each side of each jaw, bringing the total number of teeth to thirty-four, instead of thirty. (See p. 13.)*



SKELETON OF HYÆNA.

In speaking of the Cat family, we mentioned that the characters of the floor of the skull, and particularly of the swollen, bulb-like *bulla tympani*, were of great importance in determining the position of an animal in the series. Now this *bulla* in the Hyæna is large and rounded, as in Cats, but differs in the fact that it is not divided by a bony partition into two compartments. The external opening of the cavity, too, is quite flush with its outer wall, and the clamp of bone (see figures on pp. 11 and 79) is quite close to its hinder wall.

In these characters, as well as in certain matters of internal structure, such as the presence of a small *cæcum*, or "blind-gut," the Hyænas approach to the Cats and Civets, being connected with the latter group by the curious Aard-Wolf. In other respects they approach the Dog family, their nearest ally in that group being the Cape Hunting Dog.†

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* The dental formula is—incisors, $\frac{3-3}{3-3}$, canines, $\frac{1-1}{1-1}$, premolars, $\frac{4-4}{3-3}$, molars, $\frac{1-1}{1-1}$, = 34.

† *Lycaon.*

CALIFORNIA

15

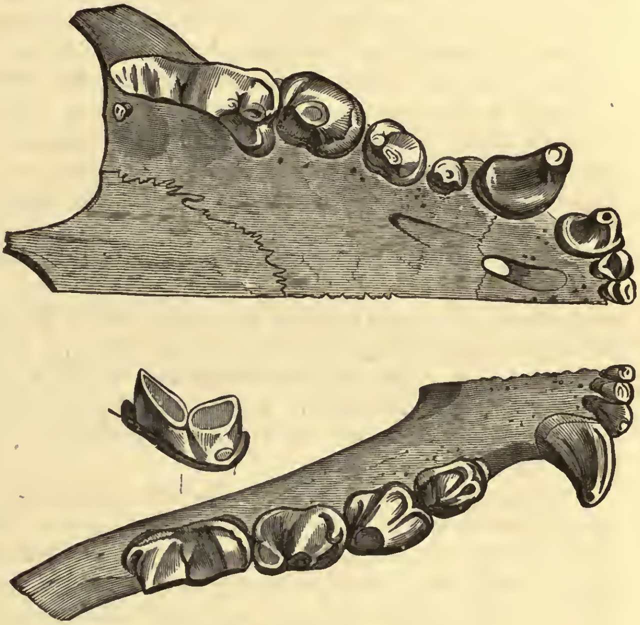
STRIPED HYÆNAS AND JACKALS.

THE SPOTTED HYÆNA.*

This species exists over the whole of Africa south of the Sahara, a portion of the continent which differs in a remarkable manner in its animal productions from the northern part; so much so that in a division of the world into regions for the purposes of studying the geographical distribution of animals, the north of Africa is united with Europe, while its ultra-Saharal portion is formed into a distinct region. Over this *Ethiopian region,* then, the Spotted Hyæna ranges, extending from Abyssinia and the Soudan in the north, where it meets with its striped brother, to Cape Colony, where it exists along with the curious Aard-Wolf. It is known as the "Wolf," or "Tiger-Wolf," by the Cape colonists, who, it seems, have a fancy for giving animals wrong names. We have seen already that the Leopard is with them a "Tiger."

The skin is of a yellowish-brown ground tint, irregularly blotched with circular black spots. On the back of the neck and on the withers it has a quantity of long stiff hairs, forming a kind of reversed mane. The fur is coarse and bristly, its character adding greatly to the animal's singularly unattractive appearance. The height at the shoulder is about two feet six or eight inches, the extreme length five feet ten inches, of which length the tail takes up some sixteen inches.

Like some other beasts of a similarly mean nature, the Spotted Hyæna prefers not to do his own killing, but likes better to live as a sort of humble messmate on those better provided than himself with the courage requisite to good hunters. When he does cater for himself, instead of subsisting on the leavings of his betters, he always makes his attack in a cowardly way, and trusts rather to stratagem than to any of the higher qualities of a sportsman. Dr. Livingstone says:—"In the evening of our second day at Serotli, a Hyæna appearing suddenly among the grass, succeeded in raising a panic among our cattle. This false mode of attack is the plan which this cowardly animal always adopts. His courage resembles closely that of a Turkey-cock. He will bite if an animal is running away; but if the animal stand still, so does he."


TEETH OF SPOTTED HYÆNA.

Other authors tell a similar tale, showing, too, that under cover of darkness the Hyæna can be moderately plucky; can, at any rate, muster sufficient courage to attack the herds in an encampment. "More than once, during dark and drizzling nights, they made their way into the sheep-kraal, where they committed sad havoc. We had several chases after them, but they managed invariably to elude us."† Again, "The Sheep having been placed in a pit to prevent them from straying, were visited during the night by a party of Hyænas, which slaughtered some and drove the residue to the summit of a high hill, where they were found the following morning."‡

The Hyæna has his misfortunes, like other beasts; Sheep are not to be had every day, often food is scarce, and he has to go with an empty stomach for days together. He may suffer, too, in other ways, besides hunger. Thus Mr. Andersson relates:—"Almost the first animal I saw at this place was a gigantic 'Tiger-Wolf,' or Spotted Hyæna, which, to my surprise, instead of seeking safety in flight, remained stationary, grinning in the most ghastly manner. Having approached within twenty paces, I perceived, to my horror, that his fore-paws and the skin and flesh of his front legs had been gnawed away, and that he could scarcely move from the spot. To shorten the sufferings of the poor beast, I seized my opportunity and knocked him on the head with a stone, and catching him by the tail, drove my hunting-knife deep into his side. But I had to repeat the operation more than once before I could put an end to his existence. I am at a loss to account for his mangled condition. It certainly could not have been from age, for his teeth were good. Could it be possible that, from want of food, he had become too weak for further exertions, and that, as a last resource, he had attacked his own body? Or, was he an example of that extraordinary species of cruelty said to be practised by the Lion upon the Hyæna, when the latter has the insolence to interfere with the monarch's prey?" . . . "It is asserted by more than one experienced hunter, that when the Hyæna proves troublesome, the Lion has been known to bite off all its feet, and, thus mutilated, leave the poor animal to its fate."

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* *Hyæna crocuta.*

† Andersson.

‡ Harris.

It may well be imagined the horrible nuisance such animals are to all South African travellers. They steal everything they can get at. They devoured two handsome flags of Mr. Andersson's which he had hoped to plant on the shores of Lake 'Ngami. But, perhaps, the greatest trouble is caused by their infernal cachinnations; no noise in the forest produces so much discomfort, for though not so loud as the Lion's roar, it is totally devoid of grandeur, and is only hideously grotesque and vile in the ears of all but Hyænas, who, we suppose, are charmed by it. The traveller we have just mentioned was, during an illness, laughed to scorn in the most amazing fashion by Hyænas and Jackals, and their derision was too much for his equanimity at a time when he sorely needed sympathy and help. Flesh and water had become very scarce, and in his trouble he says, "One evening I desperately resolved to go to the water myself in the hope of succeeding better [than the attendants]. Accordingly I ordered my servants to prepare a 'skäran,' and to carry me there, taking the chance of being run over or gored by Elephants or Rhinoceroses, for in my disabled state it was impossible, should any animal charge, to get out of its way. Seeing my helpless condition, the men remonstrated, but I was resolved to go, and fortune favoured me. I had patiently waited till nigh morning without seeing anything but Hyænas and Jackals. I believe these creatures knew I would not hurt them, for they approached within a very few paces, staring and laughing at me in the most impudent manner. I threw gravel pebbles at them, but this only served to increase their mockery. I could stand it no longer, but hurled my camp-chair at their heads, when they quickly betook themselves to flight."

Livingstone had the same trouble with the fearful din. "An astonishing number of Hyænas collected round, and kept up a loud laughter for two whole nights. Some of them do make a very good imitation of a laugh. I asked my men what the Hyænas were laughing at, as they usually give animals credit for a share of intelligence. They said that they were laughing because we could not take the whole, and that they would have plenty to eat as well as we." Any one who has never heard the Hyæna laugh, and is anxious for that pleasure, has only to visit the Zoological Gardens at feeding time. Some give utterance to such horrible cachinnations when stirred up by the keeper, that one would think they are enough to wake the dead and madden the living.

Most hunters think it quite *infra dig.* to hunt so contemptible and cowardly a beast as the Hyæna. Regular expeditions are, however, organised against it by the Cape colonists, who set fire to the brushwood, to drive out the animals, which are then attacked by Dogs. A method of killing, considered more suitable to the beast, is that of the trap. Mr. Andersson succeeded in killing several by means of a cleverly arranged spring-gun.

THE BROWN HYÆNA.*

The Brown Hyæna, or "Strand-Wolf" of the Cape colonists, is tolerably common in South Africa, though far less so than the spotted species. It is a smaller animal than the latter, its usual height at the shoulder being about two feet four inches, its length, including the tail, four feet ten inches, the tail itself being about a foot in length.

Its general colour is reddish-grey, brindled with brown and black stripes or spots. The extremities are yellowish, with deep black transverse bands. The tail is black, with red hairs towards the tip.

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* *Hyæna brunnea or fusca.*

As to habits, there is really nothing to add to what has already been said with regard to the Spotted Hyæna, except that it is especially common at the sea-side, and feeds a good deal on dead bodies thrown upon the shore. It only dares to attack flocks when very hungry.

THE STRIPED HYÆNA.*

The Striped Hyæna takes the place of the spotted kind over the northern part of Africa. It also extends into Asia, where it ranges over Asia Minor and Persia, and through India to the foot of the Himalayas. Amongst other places, it is "common in every part of Palestine, and indifferent as to the character of the country. We obtained the young occasionally in spring, and procured on Mount Carmel the largest pair of adults I ever saw. The old rock-hewn tombs afford to the Hyæna convenient covert. It attacks the graves even in the vicinity of towns."†

HYÆNAS IN AN ARABIAN CEMETERY.

In ground-colour it resembles the spotted kind, but instead of being marked with spots, its hide is covered with complete black transverse bands like the hoops of a barrel, which extend downwards on to the legs. It is as nearly as possible of the same size as the brown variety.

As to its habits and characteristics, there is little to add to what has already been said of its South African brother; it follows the Lion for scraps, roams about the Arab cemeteries to dig up and devour the dead, prowls round the towns and villages in Egypt and elsewhere to pick up offal, and is always the same ugly, ill-conditioned, repulsive, and yet useful beast. For the Arabs and Egyptians are never greatly inclined to sanitary reform, and without Hyænas, Jackals, and Vultures, would be in a sad case indeed.

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* *Hyæna striata.*

† Canon Tristram.

As to the animal's cowardliness, every writer bears witness. Jules Gérard says:—"The Arabs say, 'as cowardly as a Hyæna,' and the Arabs are right." So much do the sons of the desert despise their scavenger, that when Gérard killed one with his sabre, they implored him never again to use the defiled weapon, saying that it would certainly betray him after having been sheathed in such a dastardly carcass. It is stated that the Dog is the only animal the Hyæna dares attack, and even this game they like some help in killing. "When they feel inclined to eat a Dog, they hang about some douar, in the neighbourhood of which there happens to be a good cover. The female stations herself behind some brushwood, and the male goes towards the Dogs, who attack him, and follow him as far as the position of his consort. The female comes out at the fitting moment to attack, throttle, and devour on the spot the Dog who ventures farthest in pursuit of her husband."

Although the Hyæna is generally considered unworthy of being hunted, yet the Arabs occasionally condescend to come to the rescue of their Dogs, by beating their destroyers to death. They have also a curious "yarn" about a new and singular way of killing a Hyæna—a similar process to the traditional method of bird-catching. "The Arab who finds a Hyæna in his hole, takes a handful of Cow's dung, and presents it to him, saying, 'Come, and I will render you beautiful with henna.' The Hyæna holds out his paw; the Arab seizes it, drags him out, then gags him, and causes him to be stoned by the women and children of the douar, as a cowardly and unclean beast." One would have imagined that a Hyæna of ordinary mental capacity would be far too old to be caught with this sort of chaff!

THE CRYPTOPROCTA FAMILY.*

This family contains a single animal only, so that the description of the family and of the species will be identical. It has no English name, and must, therefore, be known by its scientific appellation, which is, unfortunately, none of the most musical.

THE CRYPTOPROCTA.†

This little animal is extremely interesting, from the fact that it forms a perfect transition between the Cat family on the one hand, and the Civet family on the other. Like the Cats it has truly retractile claws; unlike them it is *plantigrade*, or, rather, *semi-plantigrade*, for it does not walk on the tips of its toes, like a Cat or Dog, neither does it keep the whole sole of the foot flat to the ground like a Bear, but the soles of both fore and hind feet are devoid of hairs, except for a short space near the ankle and heel, and it is the large hairless space which is applied to the ground in walking.

The characters of the skull are almost exactly half way between those of the two families we have mentioned. The bulb of the ear has its opening quite flush with its outer wall, but is far less swollen than in the Cats. The teeth differ from those of Cats in one important particular, namely, in the fact of there being one more premolar in each jaw.

The Cryptoprocta is about thirteen inches and a half long from snout to root of tail, the latter appendage being nearly as long as the body. The general colour is light brownish-red, this tint being produced by the individual hairs being ringed with yellow and brown alternately. The body is slender and elegantly formed. The head is also well shaped, with a pointed snout, and large rounded ears. There are five toes on each foot, and, as we have already mentioned, the claws are provided with true retractile ligaments.

This curious and interesting little animal is very rare; only one or two specimens having reached Europe. Even at the present time hardly anything is known of its internal organs. It was first brought to England forty or fifty years ago. "Mr. Telfair, President of the Mauritius Natural History Society, who presented the animal to the Zoological Society of London, received it from the interior and southern part of Madagascar, and stated that it was the most savage creature of its size he ever met with. Its motions and power and activity were those of a Tiger, and it had the same appetite for blood and destruction of animal life. Its muscular force was very great, and the muscles of its limbs were remarkably full and thick. It lived with Mr. Telfair for some months."

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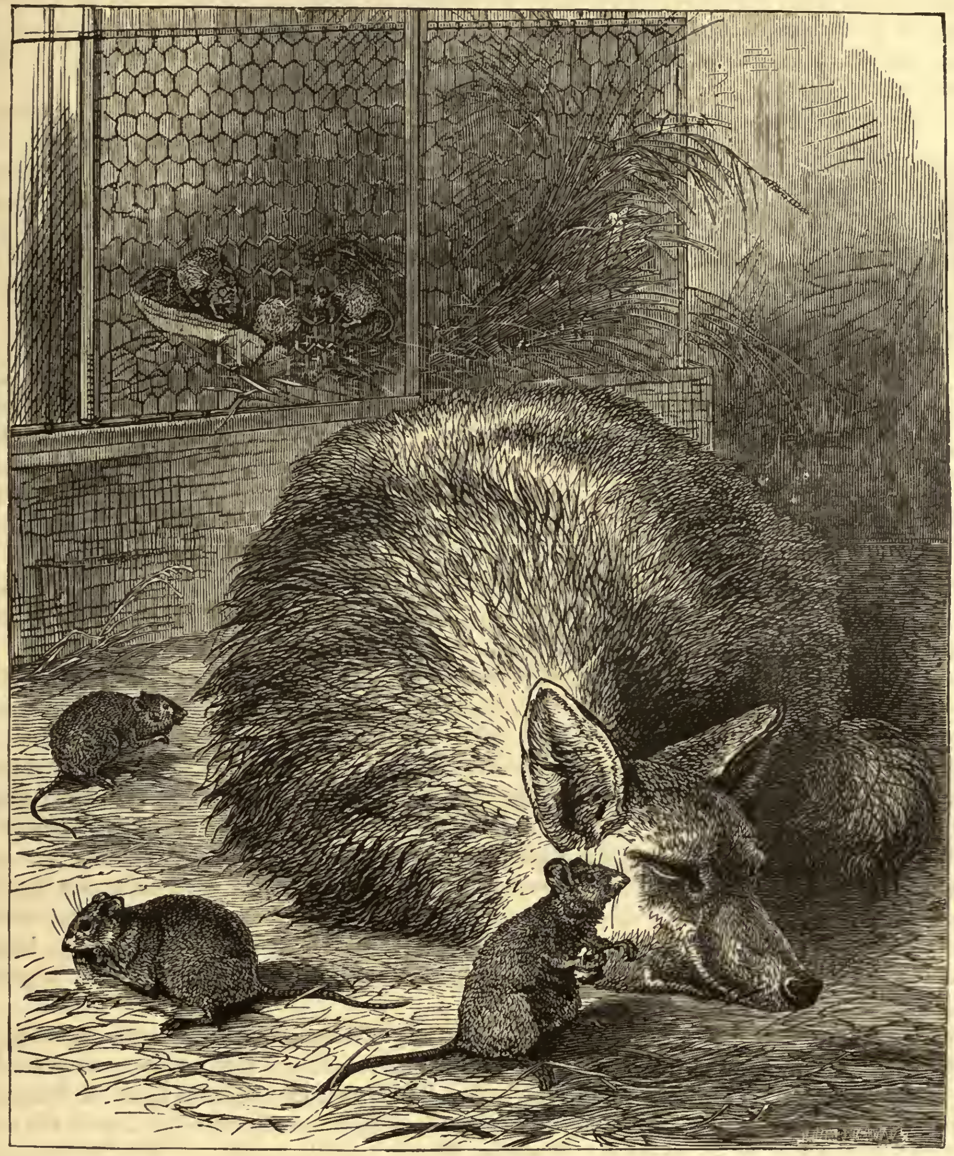
* *Cryptoproctidæ.*

† *Cryptoprocta ferox.*



AARD-WOLF.

THE AARD-WOLF FAMILY.*

This family contains but a single genus and species, viz. :—

THE AARD-WOLF.†

This is a remarkable animal inhabiting the southern parts of Africa, where its range is almost co-extensive with that of the brown variety of the Hyæna. It is an extremely interesting animal, as it forms a connecting link between the Civet family and the Hyænas; although more nearly allied to the latter than to the former, it is found to be impossible to assign it to one of these groups in preference to the other, and it is, in consequence, placed in a family by itself.

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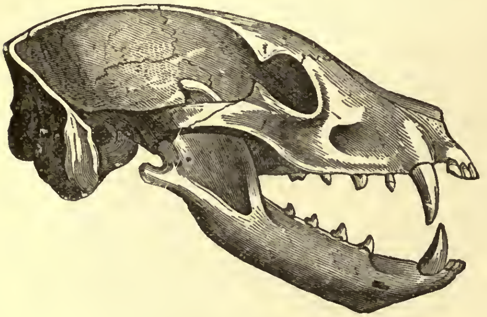
* *Protelidæ.*

† *Proteles Lalandii.*

This rare animal was first mentioned and described by Andrew Sparman in 1772–6, but his account of it attracted little notice until it was re-discovered by the traveller Delalande, who brought specimens to France, where the beast was described and christened after him, *Proteles Lalandii*, or *Delalandii*.

The relationships of the Aard-Wolf are well shown by its external appearance. It has the sloping back of a Hyæna, owing to the fore legs being longer than the hind legs; but its head is quite Civet-like, the snout being long and pointed, and altogether unlike a Hyæna's. Its size is that of a full-grown Fox, but it stands higher upon its legs; its ears are considerably larger and more naked, and its tail shorter and not so bushy. At first sight it might be easily mistaken for a young Striped Hyæna, so closely does it resemble that animal in the colours and peculiar markings of its fur, and in the mane of long stiff hair which runs along the neck and back; indeed, it is only to be distinguished by its more pointed head, and by the additional fifth toe of the fore-feet. It is also quite Hyæna-like in colour, being of a dull yellowish-grey tint, and marked with dark brown stripes and a black muzzle.



SKULL OF AARD-WOLF.

The skull has all the essential characters of that of a Viverrine, the form to which it approaches most nearly being the Ichneumon. The teeth are also Civet-like, but in the characters of its internal organs it approaches more nearly to the Hyænas.

"In its habits and manners the Aard-Wolf resembles the Fox. Like that animal it is nocturnal, and constructs a subterraneous burrow, at the bottom of which it lies concealed during the day-time, and only ventures abroad on the approach of night to search for food, and satisfy the other calls of nature. It is fond of the society of its own species; at least many individuals have been found residing together in the same burrow; and, as they are of a timid and wary character, they have generally three or four entrances to this hole; so that, if attacked on one side, they may secure a retreat in an opposite direction. Notwithstanding the disproportionate length of their fore legs, they are said to run very fast, and so strong is their propensity to burrow, that one of M. Delalande's specimens, perceiving itself about to be run down or captured, immediately ceased its flight, and began to scratch up the ground, as if with the intention of making a new earth." Its food consists very largely of carrion, but it also devours Ants. Owing to the former "high" kind of diet, the animal is generally possessed of an extremely bad smell.

With regard to its fighting propensities, which it probably possesses in common with all its relations—partly from the necessities of the struggle for existence, and partly from pure quarrelsomeness—we may mention Professor Flower's observation, that there is a "rounded patch in front of each wrist joint," or "knee," as the wrist of digitigrade quadrupeds is usually called, just as if the animals were in the constant habit of kneeling. Professor Flower adds in a note:—"Mr. Bartlett informs me that this is the habit both of the *Proteles* and the Hyænas, especially when fighting. He attributes it, at least in the case of the Hyænas, to an instinctive dread lest their feet should be seized and crushed by the powerful jaws of their adversary."

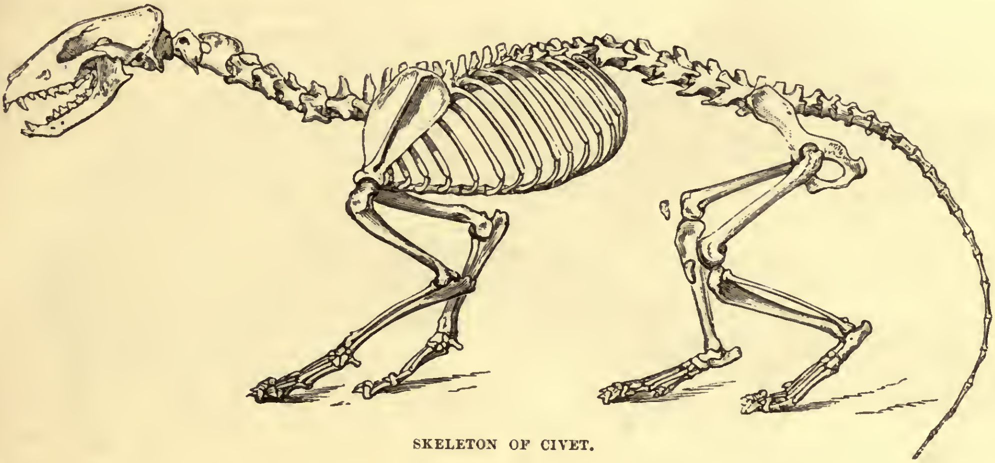
CHAPTER VI.

THE CIVET FAMILY.

General Characteristics of the Civet Family—Their Scent, Skull, and Teeth—THE AFRICAN CIVET—Its Characters and Habits—THE ASIATIC CIVET—THE LESSER CIVET—THE GENETTE—THE MUNGOOS, or ICHNEUMON—Curious Superstition regarding it—THE CRAB MUNGOOS—THE PARADOXURE—THE BINTURONG.

THE name of this family* is given to it from the fact that the most important forms included in it are what are known as Civets, or Civet Cats, animals from which the well-known perfume of that name is obtained.

The civet is a white, fatty substance, found in two curious little pouches or turnings-in of the skin just under the animal's tail. Thus Touchstone says: "Civet is of a baser birth than tar; the very uncleanly flux of a Cat." The perfume "is procured by scraping the inside of the pouch with an iron spatula at intervals, about twice a week. If the animal is in good condition and a male, especially if he has been irritated, a drachm or thereabouts is obtained each time. The quantity collected from the female does not equal that secreted by the male. Civet, like most other articles of this nature, is much adulterated, and it is rare to get it quite pure. The adulteration is effected with suet or oil, to make it heavier."



SKELETON OF CIVET.

Civet is far less esteemed as a perfume now than in former times; its odour is rank and almost overpoweringly strong, so that musk and other vegetable perfumes are now generally preferred. But in Shakspere's time it was quite "the thing." Don Pedro, in "Much Ado," says of Benedick: "Nay, he rubs himself with civet: can you smell him out by that?" And Claudio answers: "That's as much as to say, the sweet youth's in love."

The animals comprised in this group are confined entirely to the Old World, where they are represented in South Europe by the domesticated Genette; in Africa and South Asia by the true Civet (*Viverra*), the Ichneumons, so celebrated for their propensity for eating Crocodile's eggs, the curious Paradoxures, and many others.

In anatomical characters, as well as in external appearance, the animals are related both to the Cat family and to the Hyænas, as will be seen by comparing the various points of their structure with those of the two families just named. They are mostly long-bodied, short-legged animals, with stiffish fur, a long tail, and a sharp muzzle. They walk on their toes, of which they have five on each foot, like Cats; many of them, however, keeping the wrist and ankle much nearer the ground than the Cats do, and being consequently distinguished as *semi-plantigrade.* They also wander from the regular Cat-structure in the matter of their claws, which are only *half* retractile, the elastic ligament not attaining the same perfection as in the Cats. Thus we conclude that in this respect, at any rate, the Civets are less *specialised* than the Cats proper; they approach more nearly to the central plan of Mammalian structure, and are less perfect as Carnivores. We shall see that the same is the case with respect to their other characters, such as the skull and teeth.

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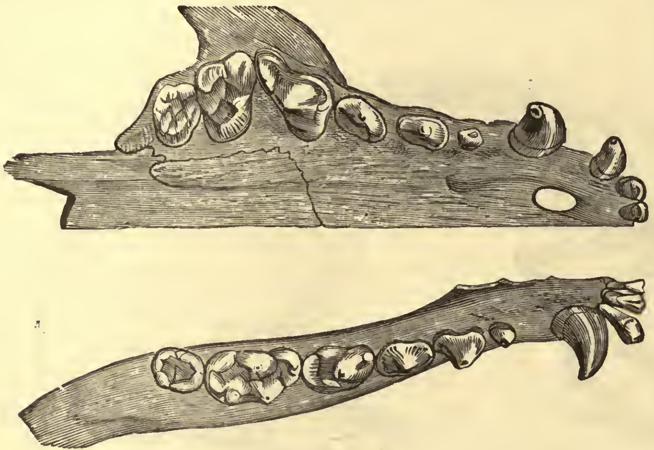
* *Viverridæ.*

The skull is not unlike what a Cat's would be if it were put on the bed of Procrustes and pulled out; for, in correspondence with the length of the snout in these creatures, the face part of the skull is long in comparison with the brain-containing part. The cheek-arches, also, are by no means so broad as in the *Felidæ,* in correspondence with the less size of the jaw muscles. But the character of the base of the skull is pretty much the same. There is, as in Cats, the large swollen *bulla,* or ear-drum bone, the small opening flush with the outer wall of the bulla, and the clamping bone closely applied to its hinder wall.



TEETH OF CIVET.

The teeth of the Civets present many interesting differences from those of the Cat tribe. In the first place, in accordance with the less perfectly carnivorous habit of the group, the jaws are longer, and, consequently, not so powerful as in the Cat; the number of teeth also is considerably increased. The incisors and canines remain the same, but the premolars are increased to four, and the molars to two on each side of each jaw,* so that there are no less than forty teeth, instead of thirty only, as in the Cats. Then the form of the teeth is altered; the canines are of far less proportional size, not having the same amount of hard work to do as the great dog teeth of the Lion or Tiger; the grinders, too, lose their scissor-blade form, and exhibit on their upper surfaces little lumps, or *cusps,* thereby developing a grinding surface such as no Cat has. This is especially the case in the Paradoxures, or Palm-Cats, which have quite lost all carnivorous habits, and feed chiefly on the fruit of palm-trees.

THE AFRICAN CIVET.†

This animal, by its rough spotted skin, calls to mind the Hyæna, to which, however, it is inferior in size, being hardly three feet long. It differs also from our laughing friend in many more important particulars. Its legs are shorter, its tail longer and not so bushy, its snout more pointed, its ears shorter, and its expression less villainous-looking. It is found in the North of Africa and in Eastern Asia.

This animal is the chief of the civet producers, its scent-glands being large and secreting constantly. At the Zoological Gardens the specimen in captivity rubs the perfume against the walls of the cage, where it is scraped up by the keeper, for whom it is a not unimportant perquisite.

The hair is long, coarse, of a brownish-grey colour, and marked with interrupted transverse bands or spots. On the middle line of the back and between the shoulders its hair is longer, forming a sort of mane. The snout is white, the tail ringed with black.

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* The dental formula is, therefore, incisors, $\frac{3-3}{3-3}$, canines, $\frac{1-1}{1-1}$, premolars, $\frac{4-4}{4-4}$, molars, $\frac{2-2}{2-2}=40$.

† *Viverra civetta.*

"The Civet approaches, in its habits, nearest to the Foxes and smaller Cats, preferring to make its predatory excursions against birds and smaller quadrupeds in the night, although, like other Carnivora, it will occasionally attack its prey in the daytime. In a state of captivity it becomes in a degree tame, but never familiar, and is dangerous to handle. The young ones feed on farinaceous food—millet-pap, for instance—with a little flesh or fish, and when old on raw flesh. Many of them are kept in North Africa, to obtain the perfume which bears the name of the animal, and brings a high price."

The great naturalist, Cuvier, says of a Civet kept at Paris:—"Its musky odour was always perceptible, but became stronger than usual when the animal was irritated. At such times little lumps of odoriferous matter fell from its pouch. These masses were also produced when the animal was left alone, but only at intervals of fifteen or twenty days. This Civet passed nearly all day and the whole night in sleeping, rolling itself up with its head between its legs; it was necessary to threaten or even strike it to rouse it from its lethargy."

AFRICAN CIVET.

THE ASIATIC CIVET.*

The Asiatic Civet, large Civet Cat, or Zibet, "inhabits Bengal, extending northwards into Nepaul and Sikkim, and into Cuttack, Orissa, and Central India on the south. It also extends into Assam, Burmah, Southern China, and parts of Malayana. It is said to frequent brushwood and grass, also the dense thorny scrub that usually covers the bends of tanks. It is very carnivorous, and destructive to poultry, game, &c., but will also, it is said, eat fish, crabs, and insects. Hounds, and indeed all Dogs, are greatly excited by the scent of the Civet, and will leave any other scent for it. It will readily take to water if hard pressed."

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* *Viverra Zibetha.*

The Zibet is forty-seven to fifty-six inches in length, from thirteen to twenty of this being taken up by the tail. It is of a yellowish-grey colour, with black spots and stripes. The throat and sides of the neck are white, and the fine tail is ringed with black.

This species is said to be tamed more easily than its African relative; but of this, as well as of its habits, very little is known.

THE LESSER CIVET.*

The Lesser Civet, or Rasse, is found in the island of Java, as well as in many parts of India, such as Nepaul and Madras. "It is not an uncommon species in Hong-Kong and the adjacent islands. In Formosa it is the commonest of all the carnivorous group. Skulking during the day in the dark ravines that intersect the hilly country in the north-west, in the twilight it threads its way with great speed through the long grass, and searches the fields for small mammals and birds. It is much dreaded by the Chinese for the havoc it commits in the hen-roost; and as its skin is somewhat valued for lining to great coats, its haunts and creeps are sought after, and traps laid for it. Of these the slip-knot noose for the head and feet is the most commonly practised and the most killing. As the cool season approaches, hawkers may be daily met with, even in the villages, offering for sale the stretched skins of these animals. The poorer classes, who are unable to purchase the dearer furs, make use of these cheaper yet pretty skins." The Rasse is about thirty-two inches in length, its tail thirteen inches. The odour of musk is so strong as to taint the skin and the flesh of the entire animal. "The Chinese," says Mr. Swinhoe, "eat the flesh of this animal; but a portion that I had cooked was so affected with the Civet odour that I could not palate it."

LESSER CIVET.

The Rasse is a much smaller animal than the two preceding species, its head and body together being about twenty-two or twenty-three inches long, and its tail sixteen or seventeen. It is of a yellowish or brownish-grey colour, with longitudinal bands on the back, and regular rows of spots on the side. The tail has eight or nine complete dark rings.

In India it is kept tame, the natives often domesticating it for the purpose of more conveniently extracting the civet.

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* *Viverra pallida* seu *rasse.*

THE GENETTE.*

This is the only Viverrine animal common in Europe, in some parts of which it is a regularly domesticated animal, and catches Mice as well as a Cat. Besides living in all the southern parts of Europe, it is found in the whole of Africa north of the Sahara, that wonderful desert which constitutes a boundary as efficient in preventing the dispersal of animals as an ocean. In this, as in many other cases, the North African animals are identical, or agree closely with those of Europe, while those of trans-Saharal Africa are of an entirely different character.

The fur of the Genette is of a grey colour, "spotted with small black or brown patches, which are sometimes round and sometimes oblong. The tail, which is as long as the body (about twenty-one inches), is ringed with black and white, the black rings being to the number of nine or eleven. There are white spots on the eyebrows, the cheeks, and the end of the nose."

The civet-pouches are, in this genus, reduced to very slight depressions at the sides of the root of the tail, and although the odour of the animal is tolerably strong—yet not disagreeably so, as in the Civet—there is no perceptible secretion from these pouches.

THE MUNGOOS, OR ICHNEUMON.†

The Ichneumons, or Mungooses, form a well-defined genus of Weasel-like animals, with semi-plantigrade feet, five toes provided with somewhat retractile claws, and long tails. The species now under consideration is found in Southern India as well as "in the North-west Provinces and the Punjab, and throughout the Deccan up to the Nerbudda River. It frequents alike the open country and low jungles, being found in dense hedgerows, thickets, holes in banks, &c., and it is very destructive to such birds as frequent the ground," for it only sucks the blood, and so kills many birds before it is satisfied.

It is sixteen or seventeen inches long, its tail fourteen, and is of a tawny yellowish-grey colour. The head is marked with reddish and yellowish rings, so arranged as to produce a resultant iron-grey hue.

There is a curious superstition about the Mungoos, of which Sir Emerson Tennent says: "I have found universally that the natives of Ceylon attach no credit to the European story of the Mungoos (*H. griseus*) resorting to some plant, which no one has yet succeeded in identifying, as an antidote against the bite of the venomous Serpents on which it preys. There is no doubt that, in its conflicts with Cobra di Capello and poisonous Snakes, which it attacks with as little hesitation as the harmless ones, it may be seen occasionally to retreat, and even to retire into the jungle, and, it is added, to eat some vegetable; but a gentleman, who had been a frequent observer of its exploits, assures me that most usually the herb it resorted to was grass, and if this were not at hand, almost any other plant that grew near seemed equally acceptable. Hence has probably arisen the long list of plants, such as the *Ophioxylon serpentinum* ‡ and *Ophiorhiza mungos*, § the *Aristolochia indica*, ‖ the *Mimosa octandria*,¶ and others, each of which has been asserted to be the Ichneumon's specific; whilst their multiplicity is demonstrative of the non-existence of any one in particular on which the animal relies as an antidote. Were there any truth in the tale as regards the Mungoos, it would be difficult to understand why creatures, such as the Secretary-bird and the Falcon, and others, which equally destroy Serpents, should be left defenceless, and the Ichneumon alone provided with a prophylactic. Besides, were the Ichneumon inspired by that courage which would result from the consciousness of security, it would be so indifferent to the bite of the Serpent that we might conclude that, both in its approaches and its assaults, it would be utterly careless as to the precise mode of its attack. Such, however, is far from being the case; and, next to its audacity, nothing could be more surprising than the adroitness with

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* *Genetta vulgaris.*

† *Herpestes griseus.*

‡ A plant allied to that which produces the well-known *nux vomica*. It is used by Indian physicians in fevers, and as an antidote to poisons.

§ A tree allied to that which produces Peruvian bark. It is called the Mungo, or "Earth-gall," by the Malays. It is also supposed to be an antidote to poisons.

‖ The "birth-wort." It is used in India as a remedy for gout, and in England is given to Cows after calving.

¶ A tree allied to the acacias and to the sensitive plant.

ICHNEUMONS.

which it escapes the spring of the Snake under a due sense of danger, and the cunning with which it makes its arrangements to leap upon the back and fasten its teeth in the neck of the Cobra. It is this display of instinctive ingenuity that Lucan celebrates when he paints the Ichneumon diverting the attention of the Asp by the motion of his bushy tail,* and then seizing it in the midst of its confusion.

"The mystery of the Mungoos and its antidote has been referred to the supposition that there may be some peculiarity in its organisation which renders it proof against the poison of the Serpent. It remains for future investigation to determine how far this conjecture is founded on truth; and whether in the blood of the Mungoos there exists any element or quality which acts as a prophylactic. Such exceptional provisions are not without precedent in the animal economy. The Hornbill feeds with impunity on the deadly fruit of the Strychnos;† the milky juice of some species of Euphorbia, which is harmless to Oxen, is invariably fatal to the Zebra; and the Tsetse Fly, the pest of South Africa, whose bite is mortal to the Ox, the Dog, and the Horse, is harmless to man and the untamed creatures of the forest."

THE CRAB MUNGOOS.‡

This animal is usually considered to be sufficiently different from the other Mungooses as to require a separate generic name. It has an almost Snake-like body, and a very long, slender snout. It is of an iron-grey colour, with a very well-marked white stripe on each side of the neck. The tail is reddish and very thick, and attains a length of eleven inches, the head and body together being eighteen inches in length.

Like the Civets, it has glands situated near the root of the tail, but these glands, instead of secreting a perfume, produce a fluid of the most abominably fetid odour, so that the beast is by no means a pleasant one to come near. Moreover, to make matters worse, the secretion of these glands does not quietly ooze out as in the Civets, but the sacs are provided with muscles, by the aid of which the animal is able to squirt out the noxious stuff to a considerable distance upon any offending person.

"This curious animal has been found in the South-east Himalayas, extending into Assam and Arakan. In its habits it is somewhat aquatic, preferring, it is said by Hodgson, Frogs and Crabs. It lives in burrows in the valleys of the lower and central regions of Nepaul."

THE COMMON PARADOXURE.§

This animal, and other species of the same genus, are often called "Tree Cats," or "Palm Cats," but as they are not Cats at all, it is better to throw over the incorrect English name, and follow the plan which, as the reader may see, is adopted on the labels at the Zoological Gardens in this and similar cases: that is, Anglicise the Latin name, even at the risk of using a somewhat long and ugly word; but, as Milton says:—

> "Why, is it harder, sirs, than Gordon,
> Colkitto, or Macdonnel, or Galasp?
> Those rugged names to our like mouths grow sleek,
> That would have made Quintilian stare and gasp."

The name Paradoxurus—"queer-tailed"—was given to the genus from the fact that some of the animals composing it have their tails curled round into a sort of screw, the under side being thus brought uppermost. The name "Tree Cat" is very inappropriate, as the Paradoxures are not in the least like Cats, but resemble far more closely the Civets, which are, indeed, their nearest allies. They are long-bodied and short-legged, with sharp snouts and long tails, and are almost completely plantigrade.

The Common Paradoxure varies a good deal as to the character of its fur. The ground-colour is usually "brownish-black, with some dingy yellowish stripes on each side, more or less distinct, and sometimes not noticeable; a white spot above and below each eye, and the forehead with a whitish band in some; a black line from the top of the head down the centre of the nose is generally observable." The individual hairs are yellowish at the base and blackish at the tip, and according to the state of wear and tear of these, the animal appears to be of various shades of tawny, brown, blackish, &c. The head and body together attain a length of twenty-two to twenty-five inches, the tail nineteen to twenty-one.

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* *Pharsalia,* lib. iv. 729.

† The nux vomica plant.

‡ *Urva cancrivora.*

§ *Paradoxurus musang.*

"This Tree Cat is a common and abundant animal throughout the greater part of India and Ceylon, extending through Burmah and the Malayan Peninsula to the island. It is most abundant in the latter wooded region, and is rarely met with in the low portions of the Deccan, Central India, and the North-West Provinces. It is very abundant on the Carnatic and Malabar coast, where it is popularly called the *Toddy Cat,* in consequence of its supposed preference for the juice of the palm, a fact which appears of general acceptation both in India and Ceylon (where it is called the Palm Cat), and which appears to have some foundation. Kelaart says: 'It is a well-established fact that it is a consumer of palm toddy.' It lives much in trees, especially in the palmyra and cocoa-nut palms, and is often found to have taken up its residence in the thick thatched roofs of native houses. I found a large colony of them established among the rafters of my own house at Tillichery. It is occasionally found in dry drains, outhouses, and other places of shelter. It is quite nocturnal, issuing forth at dark, and living by preference on animal food, rats, lizards, small birds, poultry, and eggs; but it also freely partakes of vegetable food, fruit, and insects. In confinement it will eat plantain, boiled rice, bread and milk, &c. Colonel Sykes mentions that it is very fond of Cockroaches. Now and then it will commit depredations in some poultry-yard; and I have often known them taken in traps baited with a Pigeon or a Chicken. In the south of India it is very often tamed, and becomes quite domestic, and even affectionate in its manners. One I saw, many years ago, at Trichinopoly, went about quite at large, and late every night used to work itself under the pillow of its owner, roll itself up into a ball, with its tail curled round its body, and sleep till a late hour of the day. It hunted for Rats, Shrews, and House Lizards. Their activity in climbing is very great; and they used to ascend and descend my house, at one of the corners of the building, in a most surprising manner." Sir Emerson Tennent states that in Ceylon the Palm Cat makes fearful havoc with the fowls of the villagers, "and, in order to suck the blood of its victims, inflicts a wound so small as to be almost imperceptible."

COMMON PARADOXURE.

THE BINTURONG.*

This is a curious little animal, of a black colour, with a white border to its ears, a large head and turned-up nose, and a long, immensely thick, tapering tail, which, remarkably enough, is prehensile, like that of a New World Monkey. It is twenty-eight to thirty inches long from snout to root of tail, and the tail itself is nearly of the same length. It is sometimes called the "black Bear Cat."

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* *Arctictis binturong.*

"It is slow and crouching. In its habits it is quite nocturnal, solitary, and arboreal, creeping along the large branches, and aiding itself by its prehensile tail. It is omnivorous, eating small animals, birds, insects, fruit, and plants. It is more wild and retiring than Viverrine animals in general, and it is easily tamed; its howl is loud." It walks entirely on the soles of its feet, and its claws are not retractile. It ranges from Nepaul to Sumatra and Java.

BINTURONG.

Altogether the Binturong is a decidedly interesting animal, and has been a great puzzle to zoologists. It was formerly placed in the Racoon family, to many of the members of which it bears a very strong resemblance; but this resemblance is quite superficial, and brought about by the similarity in the mode of life, &c. In the characters of the skull and teeth, it undoubtedly belongs where we have placed it, among the Civet group. Thus it forms a capital warning to those zoologists whose knowledge is only skin-deep, and who group animals entirely by their external character, without taking into account the important points of fundamental structure, which should in every case be considered first.*

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* N.B.—The description of some members of the Viverridæ, or Civet family, has been inadvertently omitted from our chapter on that group, and will be found at the end of the article on the Land Carnivora (pp. 206—208).

CHAPTER VII.

THE DOG FAMILY.—THE DOMESTIC DOG.*

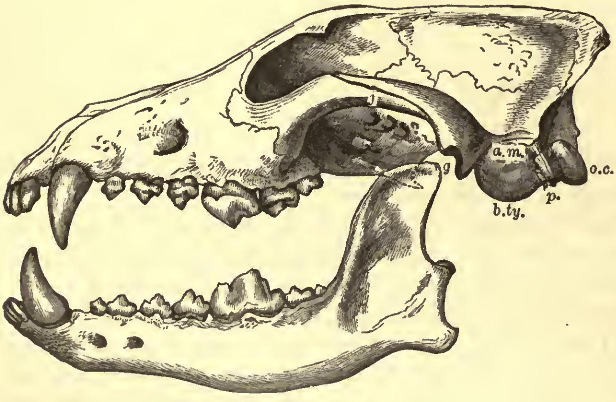
Section *Cynoidea*—Geographical Distribution—Skull of Dog—Teeth—Legs—Walk—Claws—Internal Anatomy—The Cæcum, or "Cul de sac" of the Intestine—Size—THE DOMESTIC DOG—Its Fidelity and Love—Differences between the Domesticated and Natural Species of the Family—Barking a Civilised Habit—Antiquity of the Dog—The Dog among the Hebrews and Egyptians—The Dog in the Bible—"Dog" as a Term of Reproach—Venerated by many Ancient Nations—The Dog among the Greeks and Romans—Pre-historic Dogs—Dogs in the New World—Peruvian Dogs—Superstitions about the Dog—The Dog as an article of Diet—Origin of the Dog—Identity of Structure of Wild and Domestic Dogs—The independent Training of Wild *Canidæ* by Savages in many parts of the World—Voice—Results of the whole question as to Origin—Anecdotes about Instinct, Reason, Docility—Muscles of Dog's Head—Consociation of Dogs—Anecdotes of Sense of Right, Wrong, Duty, Conscience, Sensitiveness, Honesty, Theft, Cunning, Quarrelsomeness, Magnanimity, the reverse, Revenge, Hatred—Conjugal Affection—Devotion to Man—Fickleness—Despair—Rabies and Hydrophobia—Wonderful Variety of Breed.

WE now come to the first and only family of the section *Cynoidea*, the most compact of the three divisions of split-footed flesh-eaters, and the one which contains the smallest number of forms. Only four genera, in fact, are contained in the group, namely, the Dogs, Wolves, and Foxes (*Canis*), the Long-eared Fox (*Megalotis*), the Racoon-dog (*Nyctereutes*), and the curious Hyæna-like *Lycaon.*

But the group is none the less interesting for the small number of forms included in it; for containing, as it does, the Dog, the animal of all others entitled to the name domestic, it yields in importance to neither of the larger groups, notwithstanding the varied series of creatures enclosed within their pale. Members of the Dog family are found in nearly all parts of the world, being absent only in the West Indian Islands, Madagascar, the eastern islands of the Malayan Archipelago, New Zealand, and the Polynesian Islands. When we say that the Dog is absent from those places, we mean, of course, *as a true native.* Wherever civilised man has penetrated, there his four-footed friend is sure to be found; but in the places just mentioned no Dog, Wolf, or Fox occurs as a true aboriginal. Very probably, the gigantic island of Australia should be added to the above list, as it is by no means certain that the Dingo, or wild Dog found there, has not been introduced by man.

The Dogs form a sort of connecting link between the Cat-like species on the one hand, and the Bear-like group on the other. In the matter of being digitigrade, they agree with the Cats; the number of their teeth agrees with that of the Bears; in the character of the skull they come just half-way between the two.

On the under surface of the Dog's skull there is found, in a corresponding position to the ear-drum swelling of the Cat (see p. 11), a similar rounded swelling, which, however, is smaller in proportion to the size of the skull, rougher in texture, and not so regular in shape, but sloping towards its outer aperture. Moreover, the margins of its outer aperture, round which the external ear is fixed, are produced outwards into a short tube or spout, thus making a small bony ear-passage beyond or external to the rim to which the drum membrane is attached. In the Cat, it will be remembered, there was no bony tube of this sort, but the drum parchment was flush with the margins of the opening of the drum cavity. Then the partition, which was so large in the Cat, dividing the cavity into two compartments, is here reduced to quite a low wall. Lastly, the bony clamp, which we mentioned in the Cat as being fixed quite closely against the hinder face of the bulla, is here separated from it by a small valley. These skull characters are very characteristic of the Cynoidea, and are therefore of great importance in the grouping of the Carnivora.



SIDE-VIEW OF WOLF'S SKULL.
The letters have the same significance as in the figure of the Lion's skull on p. 11.

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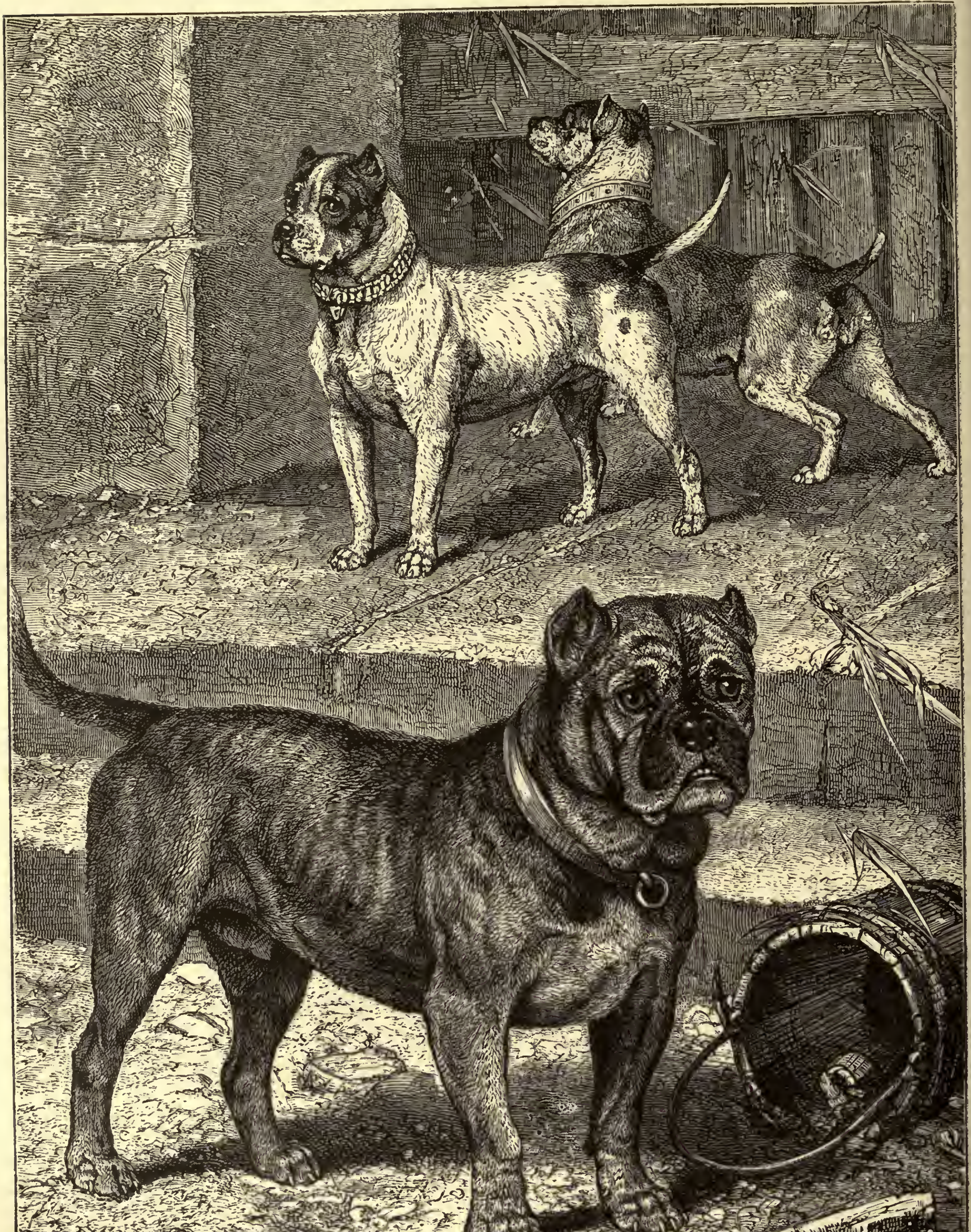
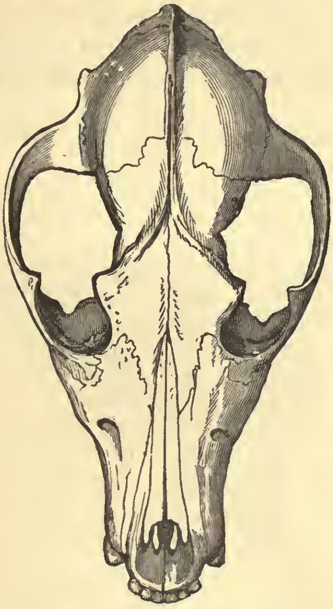
* *Canidæ.*

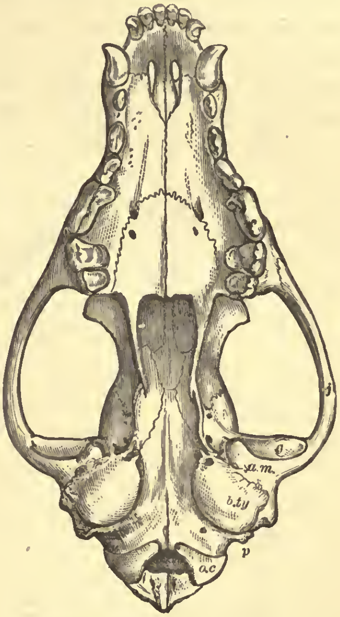
CALIFORNIA



BULL DOG.

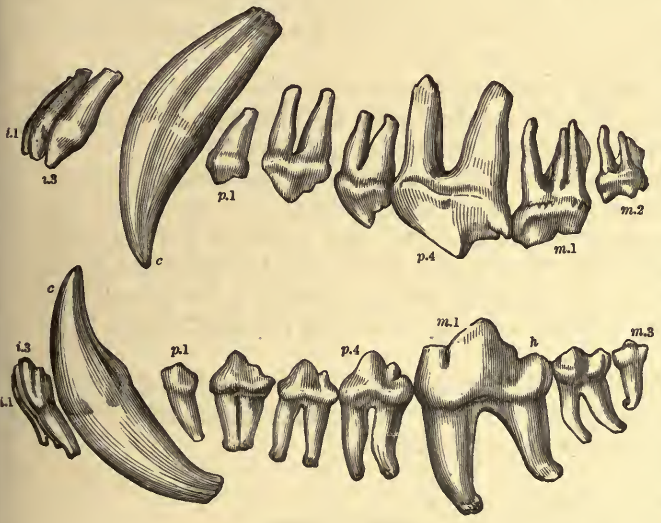
The great arches of bone beneath the eye are, in the Dog, nothing like so large as in the Cat, owing to the smaller size of the jaw muscles which pass under them. The snout, however, is much longer, in correspondence with the increased number of the teeth.


UPPER VIEW OF WOLF'S SKULL.



UNDER VIEW OF WOLF'S SKULL.

There will be no difficulty in making out the teeth of the Dog now we have studied those of the Cat. We shall find, as before, that there are in the small front bones of the upper jaw three teeth on each side, and the same number in the corresponding part of the lower jaw: these are, of course, the incisors. They are followed by the canines, or great eye teeth, of which, as in the Cat, there is one on each side of each jaw. After the canines, however, come no less than six teeth on each side of the upper jaw, and seven on each side of the lower. It is found that the first four of these are represented in the jaw of the young Dog by milk molars; therefore, as we explained in treating of the teeth in the Cat, these four are premolars, and the remaining three, molars. A likeness to what we find in the Cat exists in the fact that the last premolar of the upper jaw and the first molar of the lower jaw are very large teeth, and bite against one another. These are the *carnassials* of the respective jaws. Thus the dental formula of the Dog is—incisors, $\frac{3-3}{3-3}$, canines, $\frac{1-1}{1-1}$, premolars, $\frac{4-4}{4-4}$, molars, $\frac{2-2}{3-3} = 42$.



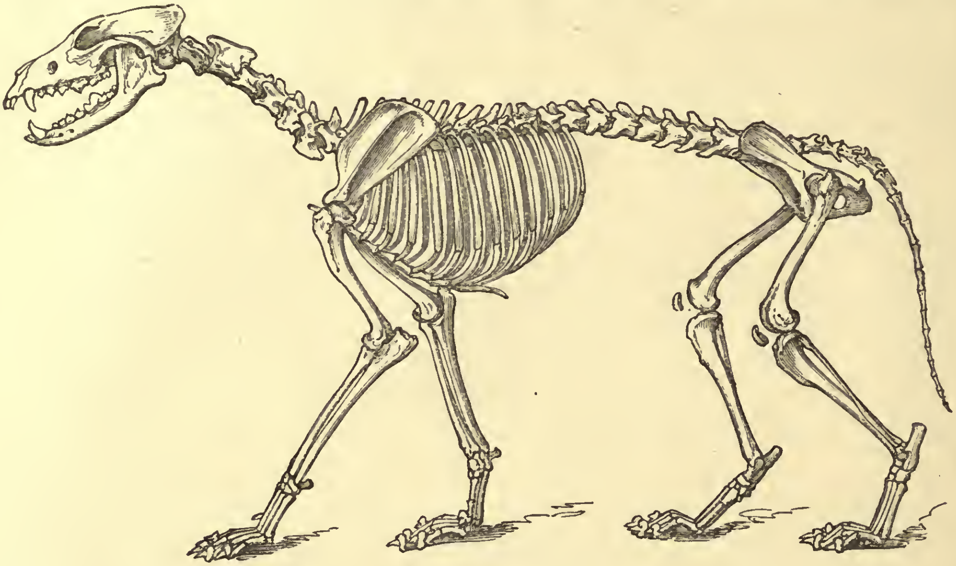
TEETH OF WOLF.

The letters have the same significance as in the figure of the Lion's teeth on p. 13, except *h*, the "heel" of the lower carnassial.

The form of the teeth, as well as their number, comes much nearer to that of an ordinary Mammal, or is much less specially carnivorous than in the Cats. The incisors are proportionally larger than in our first section; their crowns are distinctly divided into three cusps—a large central and two small lateral ones; and the outermost incisors of the upper jaw approach tolerably nearly in shape and size to the canines, being nearly half as long as the latter, and having almost lost their lateral cusps. The canines have much about the same form and relative size as in the Cat, as also have the premolars, except that the first of these, though smaller than its successor, is not so markedly so as in the Cats, while, on the other hand, the last (the carnassial) is proportionally larger.

But in the molars, or at least in all but the lower carnassial, we find something quite different, namely, an interesting approximation to the semi-herbivorous type of dentition of the Bears. Both molars in the upper jaw, and the two last in the lower, have become *bonâ fide* "grinders." The scissor-like cutting edge has disappeared, and in place of it we have a hard crushing surface, raised into four cusps—two large external and two smaller internal ones. This has relation, of course, to the mixed character of the Dog's food. The sectorial molar of the lower jaw still, however, retains its distinctive characters; its crown has much the same shape as in the Cat, but in addition possesses an extra lobe, in the shape of a large heel-like process projecting from its hinder border, and formed by a modification of its posterior cusp.

The Dog family have, as a rule, longish legs. They walk on the tip of their toes, like the Cats; but unlike the latter, their claws are not retractile. Curious to relate, however, the elastic ligament by which the drawing back of the feline claw is effected is present, but in so feeble a condition as to be quite incapable of antagonising the great flexor muscles.



SKELETON OF WOLF.

In consequence of this, the paw of a Dog is by no means such a perfect weapon as that of a Cat; and, as a matter of fact, the Dogs are distinguished from the Cats by their habit of always attacking the prey at once with their teeth, and never beginning the attack with a blow of the paw.

In the matter of internal anatomy, the Dog family differ from all other Carnivores in possessing a large "blind gut," or cæcum. The intestines, which are proportionally longer than a Cat's, are, as usual, divided into large and small, and, at the place where the large and small intestines join one another, there goes off a folded sac, communicating with the intestine at one end, but quite closed at the other, forming, in fact, a small *cul-de-sac*. The use of this curious appendage is not properly understood, nor why it should be so well developed in the Dog family, while it is very small indeed in Cats, and wholly absent in Bears.

No member of this family attains the size reached by some of the *Felidæ*, such as the Lion and Tiger, or some of the *Ursidæ*, such as the Grizzly or Polar Bear; the Mastiff is the largest of the tribe, no wild species of which is larger than an ordinary Shepherd's Dog.

THE DOMESTIC DOG.*

We have now to consider an animal which has more interest for us than any member of the animal kingdom, with the single exception of *Homo sapiens;* indeed, many people, if asked to name the creature which feels for them the most disinterested friendship, the most devoted love, and which shows the most constant and untiring kindness and attention, would without hesitation name the humble Carnivore rather than the arrogant and self-asserting Primate. It was not his servants who recognised Ulysses on his return from his long voyage; it was not even his faithful Penelope; it was the old Dog Argus, who

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* *Canis familiaris.*

"——— soon as he perceived
Long-lost Ulysses nigh, down fell his ears
Clapp'd close, and with his tail glad sign he gave
Of gratulation, impotent to rise
And to approach his master as of old."

Where shall we find an instance of human devotion, unaltered and unalterable by death, greater than that recorded by our great Lake poet of the Dog whose ill-fated master was killed in passing Helvellyn?—

"The Dog, which still was hovering nigh,
Repeating the same timid cry,
This Dog had been through three months' space,
A dweller in that savage place.
Yes, proof was plain, that since the day
On which the traveller thus had died,
The Dog had watched about the spot,
Or by his master's side.
How nourished here through such long time,
He knows who gave that love sublime,
And gave that strength of feeling, great
Above all human estimate."

No animal has been so universally or so thoroughly domesticated as the Dog; in none have the moral and intellectual faculties been so largely developed; and there is certainly none which the human race could so ill spare. We might possibly, with a proper amount of practice, become vegetarians, and so do without our sheep and cattle, our pigs and poultry. The Cat we might easily dispense with, for she is, after all, a very passive sort of creature, and rarely condescends to express either emotion or affection, whatever her feelings may be; but to lose the Dog would be to lose a friend, and a friend so faithful and true that his loss would be a veritable plucking out of the right eye and a cutting off of the right hand. As Mr. Darwin observes: "It is scarcely possible to doubt that the love of man has become instinctive in the dog," which it can hardly be said to have done, as yet, in man!

Wherever man of any degree of civilisation is found, there the Dog is to be found too—everywhere invaluable, though often grossly and brutally ill-treated. In all probability, too, Dogs occur as true natives in all parts of the world, except in the Australian region—Australia, New Zealand, and the surrounding islands; in these places he has, in all probability, been introduced by man.

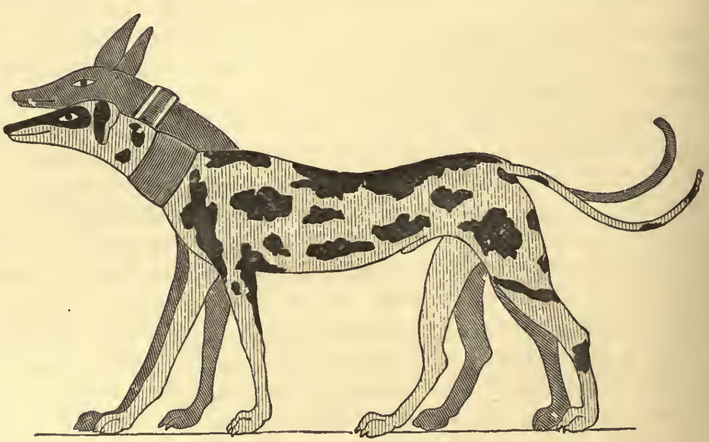
The likeness of the domestic Dog to his more immediate relatives is very close. Except in the want of obliquity in the eyes, and in the curling of the tail, so different to the straight "brush" of a Wolf or wild Dog, there is really no definite character which can be given as separating *Canis familiaris* from the wild species of the genus. Moreover, the difference between the varieties of the Dog itself is so great, that it is impossible to frame anything like a good definition which will include the Bulldog, the Greyhound, the Newfoundland, and the Terrier, and, at the same time, exclude the Dingo and the Búansú. The one constant difference is the habit of barking, "which is almost universal with domesticated Dogs, and which does not characterise a single natural species of the family."

The Dog certainly took its origin at a very remote period, for we find undoubted evidence of his existence and regular domestication in the very earliest records. Among the early Hebrews, he seems to have been unknown, or rather, despised; and it strikes one as a most remarkable circumstance that this astute nation of shepherds should never have domesticated so useful an assistant. Possibly this is partly owing to the prejudice the grand old Theists of Palestine must have felt against an animal held in great veneration as an emblem of the Divine Being by the idolatrous Egyptians; and yet this objection can hardly have had much weight, as the Hebrews kept Oxen, animals which were regularly worshipped by the Egyptians. Throughout the Old and New Testaments the Dog is spoken of with scorn and contempt as "an unclean beast," so that probably the Israelites had the misfortune only to know this friend of man in the character in which he now appears in Constantinople—as the common scavenger of the neighbourhood. The only instance in the Bible in which the Dog is mentioned as a domesticated animal is in that magnificent drama, the Book of Job, a poem of great antiquity, and very possibly not of Hebrew origin. The suffering patriarch, after recounting to his "friends" the greatness of his former prosperity, says: "But now they that are younger than I have me in derision, whose fathers I would have disdained to have set with the dogs of my flock." This passage is extremely remarkable, as showing at what an early period of the world's history the Dog was sufficiently domesticated to be capable of the arduous task of guarding Sheep—a task, the proper performance of which necessitates the total suspension of the true canine instinct, which is not to guard and protect the Sheep, but to worry and devour them.

The prejudice of the Jews against the Dog is shown at the present day by the Hindoos and by the Mahometans, with whom "Dog" is the greatest possible term of reproach, and who never think of the animal as anything but a semi-useful, degraded beast, good for nothing but to clear off the offal of the streets. Among many ancient nations, however, the Dog was held in great veneration, and was even worshipped as a god. In the passage—"Howbeit every nation made gods of their own . . . and the Avites made Nibhaz,"* the word *Nibhaz* is supposed to signify *a barker*, and it is thought that this idol had the form of a Dog. "The Egyptians had several breeds of Dogs, some solely used for the chase, others admitted into the parlour, or selected as the companions of their walks; and some, as at the present day, selected for their peculiar ugliness. All were looked upon with veneration, and the death of a Dog was not only lamented as a misfortune, but was mourned by every member of the house in which it occurred."

It is certain that the Egyptians selected their Dogs in such a manner as to produce well-marked varieties, for, as Mr. Youatt states, "there are to be seen on the Egyptian temples representations of Dogs with long ears and broad muzzle, not unlike the old Talbot Hound." This is extremely interesting as showing at what an early period the Dog had been completely differentiated from other *Canidæ*, by acquiring definite characters, quite distinct from those of his wild relations. The Assyrians, too, had advanced considerably in the art of seizing upon important varieties in the structure of their Dogs, and perpetuating them as Hounds. Mr. Darwin informs us that an undoubted Mastiff of enormous size is figured on the tomb of Esar Haddon, about 640 B.C., and he goes on to say, "I have looked through the magnificent works of Lepsius and Rosellini, and on the monuments from the fourth to the twelfth dynasties (*i.e.*, from about 3400 B.C. to 2101 B.C.) several varieties of the Dog are represented; most of them are allied to Greyhounds. At the later of these periods a Dog resembling a Hound is figured, with drooping ears, but with a large back, and more pointed head than in our Hounds. There is, also, a Turnspit, with short and crooked legs, closely resembling the existing variety."†

Both the Greeks and Romans made much of the Dog, and among the latter, Greyhounds, Hounds, House Dogs, and Lap Dogs existed. Some of them are preserved in sculpture. The Greeks had a Dog closely resembling our Newfoundland, as is made certain from a piece of sculpture, "said to have been the favourite Dog of Alcibiades, and to have been the production of Myron, one of the most skilful artists of ancient times." Dogs "were sacrificed at certain periods by the Greeks and Romans to almost all their deities, and particularly to Mars, Pluto, and Pan, to Minerva, Proserpine, and Lucina, and also to the moon, because the Dog by his barking disturbed all charms and spells,


GREYHOUNDS. (*From an Egyptian Monument.*)

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* 2 Kings xvii. 31.

† Darwin's "Animals and Plants under Domestication."

and frightened away all spectres and apparitions. The Greeks immolated many Dogs in honour of Hecate, because by their baying the phantoms of the lower world were disturbed. A great number of Dogs were also destroyed in Samothrace in honour of the same goddess. Dogs were periodically sacrificed in February, and also in April and in May; also to the goddess Rubigo, who presided over the corn, and the Bona Dea, whose mysterious rites were performed on Mount Aventine. The Dog Cerberus was supposed to be watching at the feet of Pluto, and a Dog and a youth were periodically sacrificed to that deity. The night when the capital had nearly been destroyed was annually celebrated by the cruel scourging of a Dog in the principal public places, even to the death of the animal."*

Homer, like the modern English, frequently uses the word "Dog" as an epithet of contempt—"thou Dog in forehead;" but the Dog was man's companion everywhere amongst those old Greeks. When the "God of the silver bow" strikes beasts and men with pestilence, it is said—

"Mules first and Dogs he struck, but at themselves,
Dispatching soon his bitter arrows keen,
Smote them."

Yet, mixed with these friendly Dogs there were evidently Pariah Dogs; cowards are threatened thus:—

"The Vulture's maw
Shall have his carcase, and the Dogs his bones."

Two nobler breeds are also indicated, viz., Shepherd Dogs and Hounds:—

"As Dogs that careful watch the fold by night,
Hearing some wild beast in the woods, which Hounds
And hunters with tumultuous clamour drive
Down from the mountain-top, all sleep forego."

Homer also makes indubitable reference to another breed, viz., the Boarhound:—

"As when Dogs and swains
In prime of manhood, from all quarters rush
Around a Boar, he from his thicket bolts,
The bright tusk whetting in his crooked jaws;
They press him on all sides, and from beneath
Loud gnashings hear, yet firm, his threats defy."

But more ancient than any of these records are the evidences which prove the existence of the domestic Dog among the pre-historic savages of Northern Europe. In the Danish "kitchen-middens," or heaps of household refuse, piled up by the men of the newer stone period—a time when our Scandinavian forefathers used chipped or polished flints instead of metal for their weapons—are found bone-cuttings belonging to some species of the genus *Canis.* Along with these remains are some of the long bones of birds, all the other bones of the said birds being absent. Now it is known that the bird-bones here found are the very ones which Dogs cannot devour, while the absent ones are such as they can bolt with ease, and it has been ingeniously argued from this that the remains in question did really belong to a domestic Dog, as, if the animals to which they appertained had been Wolves, they would have made short work of the long bones as well as of the others. Other Dog-bones are found in Denmark in later periods. At the time when the flint knives were succeeded by bronze a large Dog existed, and at the time when iron was used one larger still. In Switzerland, during the newer stone period, a Dog existed, which is probably the oldest of which we have any record. It "partook of the character of our Hounds and Setters or Spaniels," and, in the matter of its skull, "was about equally remote from the Wolf and Jackal." This Dog, too, like its Danish contemporary, was succeeded in the bronze period by a larger variety. Thus we see that, at a time when our ancestors were living "in dens and caves of the earth," in a state of civilisation about equal to that of the African or Australian aborigines of the present day, the Dog was already systematically kept, and "selected," that is, any good varieties which appeared were taken note of, and kept up.

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* Youatt: "The Dog."

We have mentioned above the common practice amongst the Greeks and Romans of offering Dogs as sacrifices to the numerous deities. The same custom was prevalent in early times in Scandinavia, where the Dog was often used as a sacrificial victim. Mr. Youatt says:—"Before Christianity was established among the Danes, on every ninth year, at the winter solstice, a monstrous sacrifice of ninety-nine Dogs was effected. In Sweden the sacrifice was still worse. On each of nine successive days ninety-nine Dogs were destroyed. This sacrifice of the Dog, however, gave way to one as numerous and as horrible. On every ninth year ninety-nine human victims were immolated, and the sons of the reigning tyrant among the rest, in order that the life of the monarch might be prolonged.

"On the other hand, the Dog was frequently the executioner; and, from an early period, whether in the course of war, or the mock administration of justice, thousands of poor wretches were torn to pieces by animals trained to that horrible purpose.

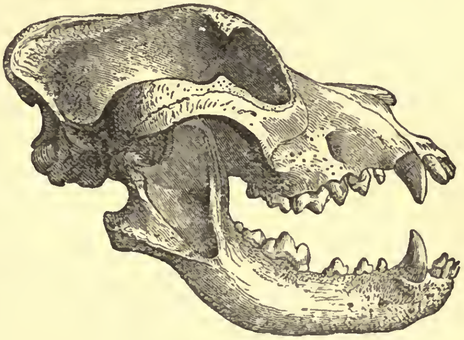
"As a counterpart to much of this, the ancient Hyrcanians may be mentioned, who lived near the Caspian sea, and who deemed it one of the strongest expressions of respect to leave the corpse of their deceased friends to be torn and devoured by Dogs. Every man was provided with a certain number of these animals, as a living tomb for himself at some future period, and these Dogs were remarkable for their fierceness."

In the New World, the Dog is, or was, held as an object of adoration by many of the natives; and dog-worship seems to have been a more ancient *culte* than the sun-worship practised by the Mexicans. Humboldt informs us that "when the Inca Pachacutec, in his religious wars, conquered the Indians of Xanxa and Huanca (the present valley of Huancayo and Juuja), and compelled them by force to submit to the worship of the sun, he found that Dogs were made the objects of their adoration, and that the priests used the skulls of these animals as wind instruments. It would also appear that the flesh of this canine divinity was eaten by the believers. The veneration of Dogs in the valley of the Huancaya is probably the reason why the skulls, and even whole mummies, of these animals are sometimes found in the Huacas, or Peruvian graves of the most ancient period. Von Tschudi, the author of an admirable treatise on the *Fauna Peruana*, has examined these skulls, and believes them to belong to a peculiar species, which he calls *Canis ingæ*, and which is different from the European Dog. The Huancas are still, in derision, called 'dog-eaters' by the inhabitants of other provinces." Humboldt also tells us that "the Peruvian Dogs were made to play a singular part during eclipses of the moon, being beaten as long as the darkness continued." But he says nothing about the origin of so curious a custom.

An animal of such intelligence as the Dog, one so necessary to the welfare of man, and devoted to him by so many ties, is certain to have a number of curious superstitions current regarding him. An excellent account of some of the most curious of them is given by the Rev. J. Gardner.

"Among the Hyperborean tribes, with whom the Dog is reckoned a very valuable animal, it occupies a conspicuous place in their traditions, being considered—as, for instance, among the Eskimo, according to the accounts given by Franklin and Parry, and other Arctic navigators—as the father of the human family. The Chippewayan Indians had a tradition that they were sprung from a Dog; and hence they neither ate the flesh of that animal themselves, nor could they look with any other feeling than horror upon those nations who fed upon it. In all these cases, probably, the Dog is the symbol of the sun. A strange notion prevails among the Greenlanders that an eclipse is caused by the sun being pursued by his brother the moon. Accordingly, when this phenomenon takes place, the women take the Dogs by the ears, believing that, as these animals existed before man was created, they must have a more certain presentiment of the future than he has; and therefore, if they do not cry when their ears are pulled, it is an infallible sign that the world is about to be destroyed.

"The inhabitants of Japan have a superstitious regard for Dogs. Thus, we learn from Picart, in his 'Religious Ceremonies of all Nations,' 'The emperor who sat on the throne when Kaempfer resided in Japan was so extravagantly fond of them, that there has been a greater number of them in that kingdom ever since his reign (if we may depend on the veracity of this traveller) than in any other nation in the whole world. Every street is obliged to maintain a fixed and determinate number of them. They are quartered upon the inhabitants, and in case of sickness they are obliged to nurse and attend them. When they die, they are obliged to inter them in a decent manner in the mountains and hills peculiarly appropriated for the interment of the people. It is looked upon as a capital crime not only to kill them, but barely to insult and treat them ill; and no one but the legal proprietor is allowed so much as to correct any of them. All this reverence and respect are owing to a celestial constellation which the Japanese call the Dog, under the influence whereof the aforesaid Emperor of Japan was born."


SKULL OF DOMESTIC DOG.

By most people the Dog is valued only during his life; his skin is not particularly valuable, and his flesh is little esteemed. This is by no means, however, the case everywhere. It is well known that the Chinese use the Dog as a regular article of food. Many of the North American tribes look upon an *entrée* of Dog as the greatest possible *bonne bouche* they can set before a stranger. Sir Leopold McClintock relates that, in the Sandwich Islands, he had most profuse apologies offered to him because there was no puppy to be had for a feast to which he was invited. The Eskimo, too, look upon a dish of young Dog as a great treat; and it is related that a Danish captain provided his friends with a feast of this kind, and when they *praised his mutton*, sent for the skin of the beast, and exhibited it to them! The Greeks and Romans also used the Dog as an article of diet, and many ancient writers, such as Galen and Hippocrates, represent Dog-meat as a highly desirable dish.

It is a remarkable circumstance, when we come to consider the probable origin of the Dog, that there is evidence of his domestication at such early periods, and by so many savage tribes in different parts of the world. As we have already seen, tame Dogs were possessed by savages in the neolithic, or newer stone period, by the Assyrians, Egyptians, Greeks, Romans, and the ancient inhabitants of North and South America, to say nothing of the numerous savage tribes at the present day, such as the Australians and the inhabitants of Guiana. Now the important question arises, had all these Dogs a common origin? Did the great neolithic Dog, the Sheep-dog of Job's time, the Greyhounds, Turnspits, and Hounds of the Assyrians and Greeks, the divinely-honoured animals of Peru, and the supposed ancestors of the Eskimo and the Chippeways, spring from a single pair? or have various wild species of *Canidæ* been tamed and converted into true domestic Dogs, by different people in different parts of the world, these various species having since been crossed and re-crossed with one another and with their parent forms, until a species has been produced as complex in its origin as the English nation, which has flowing in its veins the blood of ancient Briton, Roman, Anglo-Saxon, Dane, Norman, and Fleming?

Until recently it was thought that all the evidence which could be brought to bear on the matter pointed to a separate origin of the Dog. It was argued, for instance, that as we have evidences of distinct breeds existing in far-back periods of the world's history, there was actually no time, prior to those periods, for him to have diverged from a savage ancestor, such as a Wolf or a Jackal. It was also thought highly unlikely that a number of primitive races of man should have separately tamed different wild *Canidæ*. Mr. Youatt, one of our best authorities on the Dog, writing in 1845, says: "This power of tracing back the Dog to the very earliest periods of history, and the fact that he then seemed to be as sagacious, as faithful, and as valuable as at the present day, strongly favours the opinion that he descended from no inferior and comparatively worthless animal; that he was not the progeny of the Wolf, the Jackal, or the Fox; but he was originally created, somewhat as we now find him, the associate and friend of man."

SKULL OF YOUNG DOG.

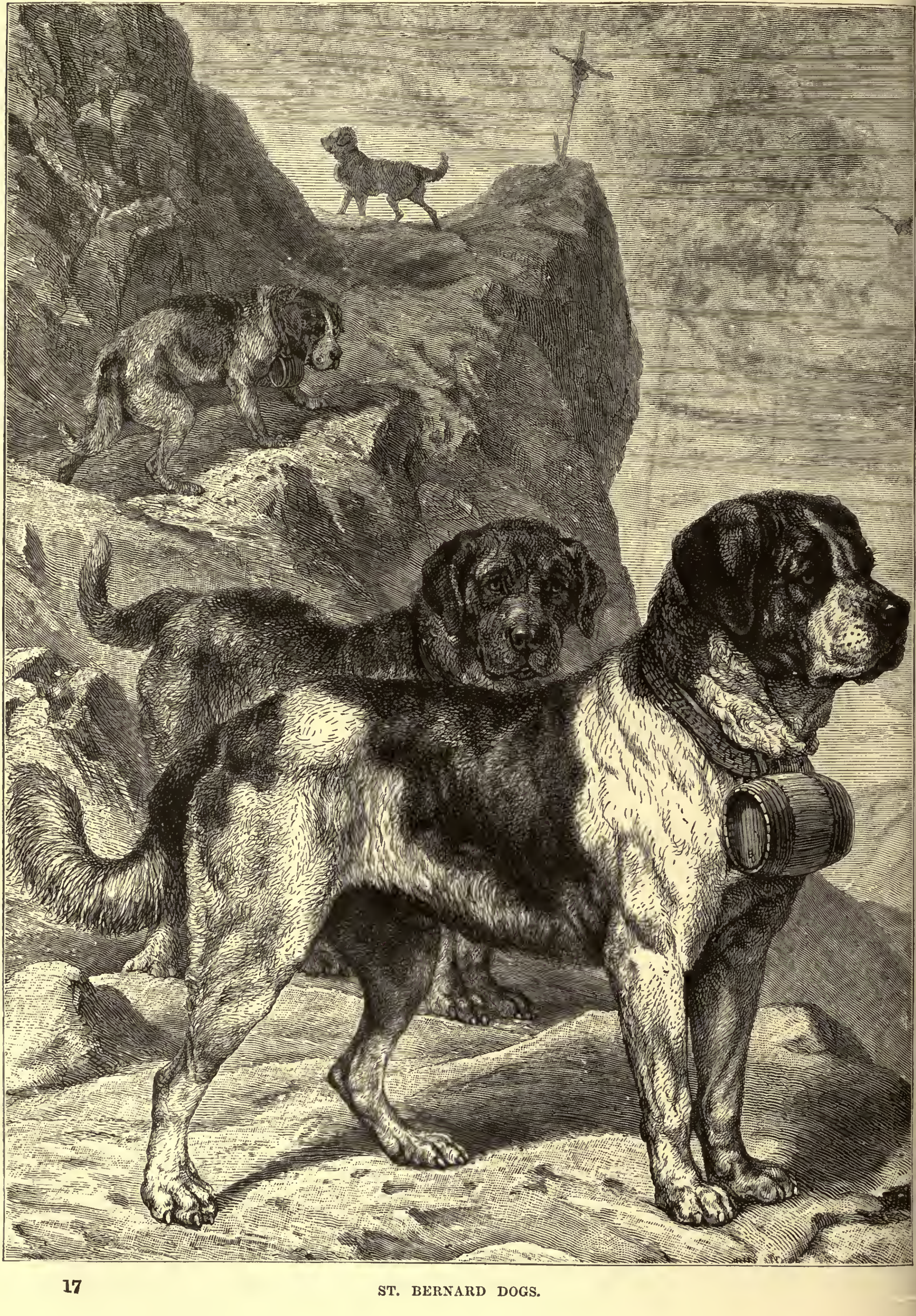
A few years ago there was no gainsaying arguments such as these, for then nearly everybody believed that the world was literally only six thousand years old, and that species were absolutely unchangeable. But Sir Charles Lyell and Mr. Darwin have "*changé tout cela.*" The argument from time fails utterly, and other facts have to be taken into consideration.

There is, first of all, the fact of identity of structure. There is absolutely no definition framable which will include all the varieties of the domestic Dog, and exclude all the wild species—none even which will include all the Dogs properly so called, both wild and tame, and at the same time exclude the Wolf and Jackal. It is the same as regards habits, instincts, mental endowments, &c. Wolves and Jackals can be and have been tamed. Domestic Dogs can become, and have again and again become, wild, and in no way better than true aborigines; and to assert that the Dog is not descended from a Jackal because his manners and customs are better, his tail more curly, and his voice a bark instead of a howl, is about as just as to assert that Englishmen cannot possibly be descended from ancient Britons, because they wear clothes instead of a coating of blue paint.

HARE INDIAN DOG.

With regard to the opinion that many races of men are not likely independently to have tamed wild *Canidæ*, there are certain facts which show that the exact contrary is the case. Savages in all parts of the world are fond of making pets of various kinds, and would have been certain to come across Wolf or Jackal pups in their wanderings through the woods. Then, again, as Mr. Darwin remarks, "At an extremely ancient period, when man first entered any country, the animals living there would have felt no instinctive or inherited fear of him, and would consequently have been tamed far more easily than at present. For instance, when the Falkland Islands were first visited by man, the large Wolf-like Dog (*Canis antarcticus*) fearlessly came to meet Byron's sailors, who, mistaking this ignorant curiosity for ferocity, ran into the water to avoid them. Even recently a man, by holding a piece of meat in one hand and a knife in the other, could sometimes stick them at night." Another important point is the readiness with which many wild species of *Canidæ* breed in confinement, so that the difficulty of perpetuating the newly-acquired characteristics of the tamed animal is, in this case, obviated. Furthermore, it is perfectly well known that savages at the present day do actually tame, and make useful to themselves, the wild Dogs of their particular countries: "the savages of Guiana

CALIFORNIA



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ST. BERNARD DOGS.

catch, and partially tame and use the whelps of the wild species of *Canis*, as do the savages of Australia those of the Dingo."

These statements certainly tend to show that there is no actual improbability in supposing that many wild species of *Canidæ* have at different times, and by different nations, been tamed and gradually modified into true domestic Dogs. But the most significant fact bearing upon the multiple origin of the Dog is the often-occurring close resemblance between the domestic Dog of a savage tribe and the wild species of *Canis* inhabiting the same district. Of this most important circumstance there are far

ESKIMO DOGS.

too many instances to allow of its being looked upon as a mere coincidence. Sir John Richardson says: "The resemblance between the Wolves and the Dogs of those Indian nations who still preserve their ancient mode of life continues to be very remarkable, and it is nowhere more so than at the northern extremities of the Continent, the Eskimo Dogs being not only extremely like the Grey Wolves of the Arctic circle in form and colour, but also nearly equalling them in size. The Dog has generally a shorter tail than the Wolf, and carries it more frequently curled over the hip, but the latter practice is not totally unknown to the Wolf, although that animal, when under the observation of man, being generally apprehensive of danger or on the watch, seldom displays this mark of satisfaction." And again, "The resemblance between the northern Wolves and the domestic Dog of the Indians is so great, that the size and strength of the Wolf seem to be the only difference. I have more than once mistaken a band of Wolves for the Dogs of a party of Indians; and the howl of the animals of both species is prolonged so exactly in the same key, that even the practised ear of an Indian fails at times to discriminate them."

As the Eskimo and Indian Dogs resemble the North American Wolf (*C. lupus*), so the Dog of the Hare Indians, a very distinct breed (see below), resembles the Prairie Wolf (*C. latrans*). So great is this resemblance that Richardson says, "I could detect no marked difference in form except the smallness of its [the Dog's] cranium, nor in the fineness of its fur, and arrangement of its spots of colour. The length of the fur on the neck, back part of the cheeks, and top of the head, was the same in both species. It, in fact, bears the same resemblance to the Prairie Wolf that the Eskimo Dog does to the great Grey Wolf." Another observer remarks that, except in the matter of barking, there is no difference whatever between the black Wolf-dog of the Indians of Florida and the Wolves of the same country. The Dogs also breed readily with the wild animals they so closely resemble. The Indians often cross their Dogs with Wolves to improve the breed, and in South America the same process is resorted to between the domesticated and the wild Dogs.

The same phenomenon is seen in many kinds of Dog in the Old World. The Shepherd Dog of the plains of Hungary is white or reddish-brown, has a sharp nose, short erect ears, shaggy coat, and bushy tail, and so much resembles a Wolf, that Mr. Paget, who gives the description, says he has known a Hungarian mistake a Wolf for one of his own Dogs. There is also a close resemblance between some of the Indian Pariah Dogs and the Indian Wolf. Some of the domestic Dogs of Egypt, both at the present day and in the condition of mummies, closely resemble the Wolf of that country; "whereas the domestic Dogs of Nubia, and certain other mummied Dogs, have the closest relation to a wild species of the same country . . . which is only a form of the common Jackal." Dogs have, moreover, been known to cross with Jackals as well as with Wolves. Lastly, in Africa, some of the natives assert that their half-tamed Dogs are derived from Foxes; and the Dogs of the Bosjesman have a striking resemblance to the black-backed Jackal (*C. mesomelas*), which, as we shall see, is a South African variety.

These facts are so significant and so important that they in reality leave only one difficulty to be settled, and that is the question of voice. As we stated above, all domestic Dogs bark, while all wild *Canidæ* express their feelings only by howls. But the difficulty here is not so great as it seems. Some domestic Dogs left on the island of Juan Fernandez entirely lost the habit of barking in thirty-three years, and a few individuals removed after that period only re-acquired it very slowly; thus, domestic Dogs allowed to run wild forget how to bark. On the other hand, Jackals, wild Dogs, and Wolf-pups reared by bitches, readily acquire the habit. Thus the last stumbling-block in the argument disappears, and we are forced to agree with Mr. Darwin, from whom many of the above facts are taken,* that "it is highly probable that the domestic Dogs of the world have descended from two good species of Wolf (*C. lupus* and *C. latrans*), and from two or three other doubtful species of Wolves (namely, the European, Indian, and North African forms); from at least one or two South American Canine species; from several races or species of the Jackal; and perhaps from one or more extinct species;" and that the blood of these, "in some cases mingled together, flows in the veins of our domestic breeds."

There is no animal so interesting as the Dog for the study of the relation between man and the lower animals in the matter of instinct, reason, conscience, and the like. As no animal has been so thoroughly domesticated, and so systematically trained and educated, so none has developed in the same degree those higher endowments which are often considered as the exclusive attributes of humanity, such as reasoning power, a sense of right and wrong, of property, and of number.

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* Darwin, "Animals and Plants under Domestication."

For the study of instinct, it is impossible to find an animal in any way approaching to him for interest, for not only does he exhibit, to a wonderful degree, the instincts common to all the higher animals, but almost every kind of Dog possesses some special instinct, imparted from a remote ancestor, and absent, or nearly so, in other varieties. We may instance the mode of "pointing" game peculiar to the Pointer, the marvellous power of following scent of the Bloodhound or Foxhound, and the acute generalship of the Shepherd's Dog, who, with comparatively little teaching, guards, drives, and keeps together a whole flock of foolish animals, which, to the Dog mind, must seem intended by Providence to be worried and eaten. These special instincts we shall consider when we come to speak of the various breeds; but we must now say a few words on those instincts which are common to the whole species.

Unlike the Lion and Tiger, the male Dog takes no interest whatever in his offspring, who are taken care of during the weeks of their helplessness entirely by the mother. She, however, quite makes up for paternal neglect by the assiduity with which she tends and cares for her feeble offspring. It is one of the most touching, and, at the same time, almost amusing sights, to see a bitch with her first litter; how jealously she watches the blind, fat, slug-like little creatures. At first she will growl and snap even at her beloved master, if he approaches too near her treasures. When they have grown a little, how fussy she becomes when they are noticed; she will even drag them by the leg, one by one, upstairs, to exhibit their perfections! For several weeks this care continues, but by the time the pups have grown half as big as their mother, and can see and run about, her solicitude diminishes. She begins to quarrel with them over bones and other titbits, and, before long, takes no more notice of them than if they were the commonest stray Dogs in the street. It is this evaporation of mother-love which so distinguishes a Dog-parent from, at any rate, a great number of human parents.

Like most animals, the female Dog, if deprived of the natural objects of her affection, will lavish her care on almost any young and helpless thing with which she may be brought in contact.

Dr. Sclater,* whilst visiting the Zoological Gardens at Antwerp, in 1875, noticed a curious instance of the blindness of maternal love in a Dog. Among other objects of attraction were "three young Tiger-cubs, born in the Gardens on the 14th of October, 1873," that had been "most successfully foster-mothered by a large bitch."

We have stated that the male Dog is perfectly oblivious of his paternal duties; we have, however, met with one instance of a Dog, who, whatever may have been his qualities as a parent, discharged with great fidelity the part of guardian, and that, too, not to one of his own species, but to one of an alien and hostile race. This curious instance of canine affection was exhibited by a small male pet Spaniel, belonging to some friends of ours, who brought up a kitten. The *food*, certainly, was supplied by the family, but the brooding and tendance were done most faithfully. On warm days, the Dog would carry the kitten and lay it in the sun, choosing some snug place out of the wind, in the garden. The kitten, a female, lived to become a very beautiful Cat; but her unsuspecting innocence led to her death. Not fearing any of the Dog-kind, she made no attempts to escape from them, and was worried to death by a strange stray Dog.

One of the most striking circumstances with regard both to the general and the special instincts of the Dog, namely, those instincts common to the whole species, and those possessed by particular breeds, is the way in which they are transmitted from parent to child. The Pointer points the first time he is taken out; the Shepherd's Dog learns his duties with astonishingly little teaching. Not only are instincts transmitted in pure breeds, but in cross-breeds the special characteristics of both parents come out with the most marvellous accuracy. " . . It is known that a cross with a Bull-dog has affected for many generations the courage and obstinacy of Greyhounds; and a cross with a Greyhound has given a whole family of Shepherd-dogs a tendency to hunt Hares. Le Roy describes a Dog, whose great grandfather was a Wolf, and this Dog showed a trace of its wild parentage only in one way—by not coming in a straight line to his master when called." The tendency to attack Poultry, Sheep, &c.,

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* "Proceedings of the Zoological Society," 1875.

"has been found incurable in Dogs which have been brought home as puppies from countries, such as Tierra del Fuego and Australia, where the savages do not keep these domestic animals. How rarely, on the other hand, do our civilised Dogs, even when quite young, require to be taught not to attack Poultry, Sheep, and Pigs!"*

A most astonishing account of an inherited mental peculiarity—an instinctive dislike—is related by Dr. Huggins, to whose researches the science of astronomy owes so much. He writes:—

"I possess an English Mastiff, by name Kepler, a son of the celebrated Turk, out of Venus. I brought the Dog, when six weeks old, from the stable in which he was born. The first time I took him out, he started back in alarm at the first butcher's shop he had ever seen. I soon found that he had a violent antipathy to butchers and butchers' shops. When six months old, a servant took him with her on an errand. At a short distance before coming to the house she had to pass a butcher's shop. The Dog threw himself down (being led with a string), and neither coaxing nor threats would make him pass the shop. The Dog was too heavy to be carried; and as a crowd collected, the servant had to return with the Dog more than a mile, and then go without him. This occurred about two years ago. The antipathy still continues, but the Dog will pass nearer to a shop than he formerly would. About two months ago, in a little book on Dogs published by Dean, I discovered that the same strange antipathy was shown by his father, Turk. I then wrote to Mr. Nicholls, the former owner of Turk, to ask him for any information he may have on the point. He replied—'I can say that the same antipathy exists in King (the sire of Turk), in Punch (son of Turk, out of Meg), and in Paris (son of Turk, out of Juno). Paris has the greatest antipathy, as he would hardly go into a street where a butcher's shop was, and would run away after passing it. When a cart with a butcher's man came into the place where the Dogs were kept, although they could not see him, they all were ready to break their chains. A master-butcher, dressed privately, called one evening on Paris's master to see the Dog. He had hardly entered the house before the Dog (though shut in) was so excited that he had to be put into a shed, and the butcher was forced to leave without seeing the Dog. The same Dog, at Hastings, made a spring at a gentleman who came into the hotel. The owner caught the Dog and apologised, and said he never knew him to do so before, except when a butcher came to his house. The gentleman at once said that was his business. So you see that they inherit these antipathies, and show a great deal of breed.'"†

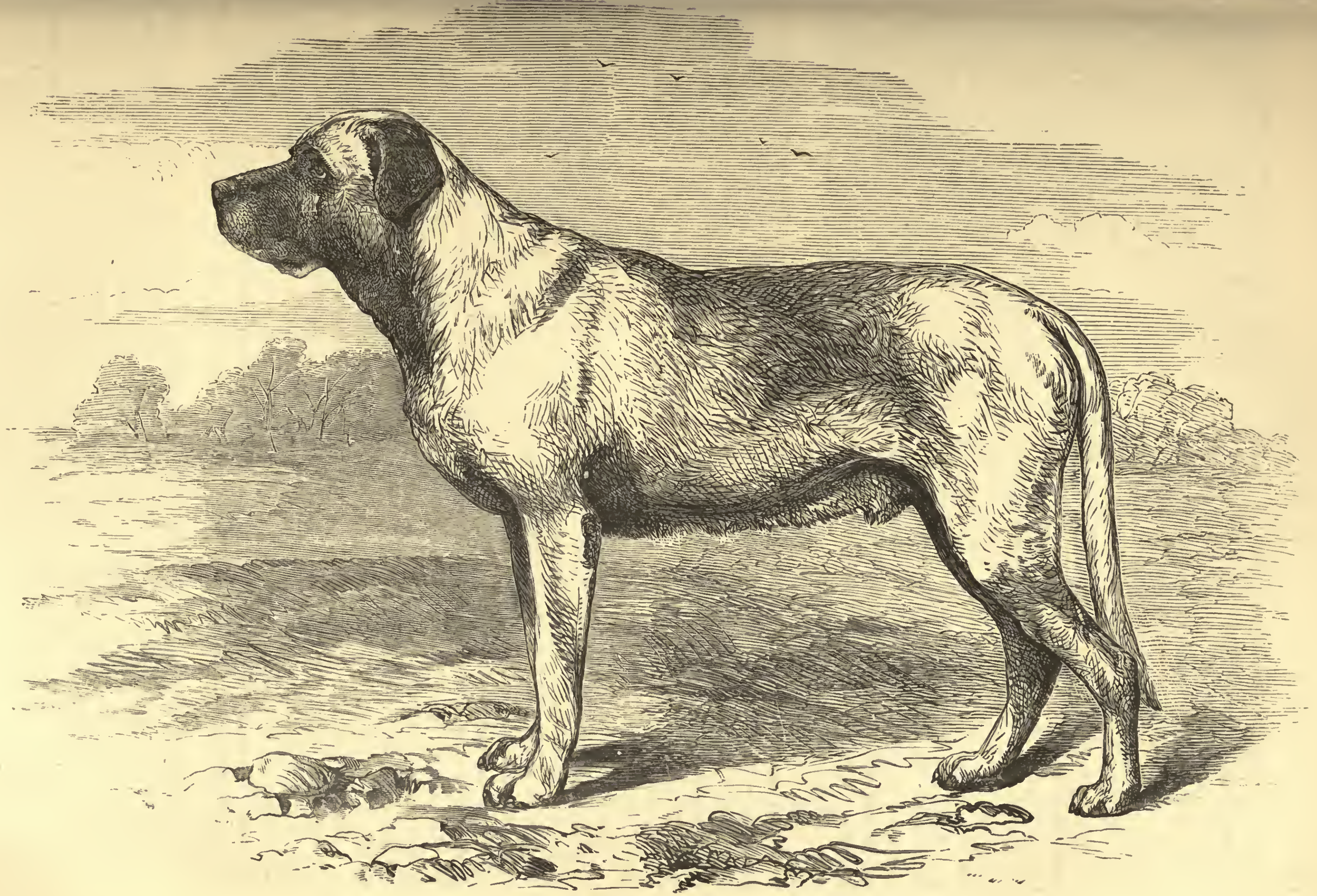
A gentleman on reading this account of Dr. Huggins's Dog, wrote to say that he possessed a son of Sybil, daughter of Turk, who possessed the family antipathy in a marked degree, and another stated that he also possessed a grandson of the redoubted Mastiff, in whom the same peculiarity was developed. Thus we see that this most remarkable instinctive dread, arising no one knows how, existed not only in Dr. Huggins's Dog, but in his father, grandfather, brothers, and nephews! It was suggested, and it seems highly probable, that the feeling in this case first arose from the fact of some ancestor of the Turk family being ill-treated by a butcher; but it is quite possible that it may have arisen spontaneously. Boswell, in his life of Johnson, quotes the "Great Lexicographer" as attributing a similar dislike to butchers noticed in the Dogs of some savage countries, where the animal was used for food, not to horror at the butcher's cruelty, but merely to the smell of carnage.

A very remarkable *trait* in the Dog's character, which has undoubtedly become instinctive, and is consequently transmitted from generation to generation, is his love of human society. A well cared-for Dog will always prefer his master's company to that of his own kind, and will take any amount of trouble, and give up any amount of personal ease, that he may not be parted from him.

But, undoubtedly, the most wonderful canine instinct is the sense of direction, the power possessed by so many Dogs of finding their way back to an old and well-loved home, after being forcibly removed from it to a new place of abode. Instances are numerous in which Dogs, taken from their usual habitation, shut up in a basket, or by night, or in a swift railway train, have unerringly found their way back, greatly to the surprise of both their new and their old masters. Mr. Wallace has suggested that this was not a true case of instinct, but that the Dog, in all probability, found his way back by smell; that he, as it were, takes a note of every smell he passes—a stagnant pool here, a haystack there, a wayside inn, a stable, &c. &c.—and, remembering not only the smells, but the order in which he

* Darwin's "Origin of Species."

† Dr Huggins, *Nature*, Vol. VII.



MASTIFF.

smelt them, he follows the scent until he arrives at his destination. There is no doubt that the Dog's olfactory sense is wonderfully acute, but this is certainly carrying it too far. Moreover, as has been remarked, the direction of the wind was quite likely to change between the Dog's two journeys, and if one of his odoriferous landmarks happened to be movable, like a flock of Sheep, where would he be? But the one fact which completely disposes of the smell theory of the phenomenon is, that there is no evidence of a Dog's ever returning to his old home by the way he was taken from it; he invariably takes a different route, usually a short cut. For instance: "A Hound was sent by Charles Cobbe, Esq., from Newbridge, county Dublin, to Maynalty, county Meath, and thence, long afterwards, conveyed to Dublin. The Hound broke loose in Dublin, and the same morning made his way back to his old kennel at Newbridge, thus completing the third side of a triangle by a road he had never travelled in his life." Again, Mr. Romanes narrates the case of a Dog who, when taken by his master from Oban to Greenock, by sea, was grievously sea-sick. The next time the journey had to be made, the Dog, remembering his former trouble, jumped off the boat and disappeared. His master continued his voyage, and was greatly surprised, when he arrived at Greenock, to find the Dog waiting for him on the wharf! The distance from Oban to Greenock is fifty miles in a straight line, and this straight course the Dog is not likely to have taken, as his way would then have lain across mountains, a lake, and an arm of the sea. Thus it would seem that the Dog must have some sort of notion of direction, must possess, as it were, a special sense of the nature of a mariner's compass, and that, so far from his sense of locality being due in any way to power of smell, it is perhaps the most striking example of a pure instinct which it is possible to conceive.

We have not given many instances of instinct in the Dog, for it is a faculty of which no one denies the existence, but of reasoning power it is necessary to treat more fully, as many persons are disposed wholly to deny the presence of that faculty in all the lower animals, and to make it the exclusive prerogative of man. Every one who has kept a Dog must have seen it perform actions which, in a human being, would unhesitatingly be put down to reason; every one must have heard of cases in which a choice of two or more courses was presented to a Dog, and in which he has, after due reflection, chosen the best.

We are indebted to Mr. Hugh Miller, F.G.S., for a good instance of reasoning power in a Dog belonging to his brother, Captain Miller. This Dog, "Tara" by name, a Greyhound with a dash of Pointer, was one day taken out with a carriage for a run of forty miles. Now, it is estimated that a Dog, by his uncontrollable habit of "meandering," usually goes over about three times the ground of the horse or man he accompanies, so that on this occasion Tara must have run considerably over a hundred miles, and was in consequence rather done up when she reached home. She usually slept in the dining-room, whence she was always ejected at 7 A.M. by the housemaid who cleaned the room. On this occasion, however, no amount of persuasion could induce Tara to occupy her accustomed sleeping-place; she positively insisted upon following her master upstairs to his bedroom, where she evidently expected she could remain undisturbed for a good long rest, and where she did actually remain till 2 P.M. on the following day.

Another and more striking instance of the exercise of reasoning power is given in the *Quarterly Journal of Science* for April, 1876. It is there stated that a Newfoundland Dog was "sent across a stream to fetch a couple of hats, whilst his master and friend had gone on some distance. The Dog went after them, and the gentlemen saw him attempt to carry both hats, and fail, for the two were too much for him. Presently he paused in his endeavour, took a careful survey of the hats, discovered that one was larger than the other, put the small one in the larger, and took the latter in his teeth by the brim!"

In the face of facts such as these, the question as to whether Dogs possess the power of reasoning becomes merely one of words. No one would say that a human being who did as this Dog did acted from blind instinct. One can easily call to mind several persons of one's acquaintance, to whom it would be the height of presumption to deny the possession of reason, and who yet would never have thought of putting the hats one inside the other. It is related that the great Newton made, in his study door, a big hole for his Cat and a little one for the kitten. In doing this he showed far less exercise of reason than the Dog; and it is quite conceivable that if he had been sent to fetch the hats he would have brought them over separately! We shall give other instances of reason in the Dog when we come to speak of conscience, cunning, revenge, &c., as exhibited by him. Any book of Dog-anecdotes will furnish the reader with many more, so that, on the whole, one is forced to the conclusion that, to prove the absence of reason in the Dog, one must argue something after this fashion:—Dogs often perform actions which, in man, would undoubtedly be attributed to reason. But man is the only member of the animal creation which possesses the reasoning faculty. Therefore, all actions in the Dog which simulate reason are, in reality, due to blind instinct. Therefore, Dogs do not possess the reasoning faculty. Which was to be demonstrated.

One of the most interesting points in the Dog's character, and one in which many of his human masters would do well to imitate him, is his teachableness. A good Dog may be taught almost anything, no matter how difficult or distasteful, or how foreign to his nature. And not only will he learn to do anything, but to understand anything, for there can be no doubt whatever that Dogs actually do understand what is said to them, in many cases, quite irrespectively of tone or gesture. Of course, with an ordinary Dog who has received no special and systematic training, it is the tone of his master's voice or his gestures which convey meanings to him, far more than the actual words; but with many Dogs, whose intelligence is great, and whose education has been thorough, this *acme* of culture is attained, and the animal does, undoubtedly, understand the actual words said to him. As an instance, we may mention the well-known case of "Sirrah," the Ettrick Shepherd's Dog, who wanted only the words "Sirrah, my man, they're a' awa'!" to proceed immediately in search of the missing flock. It is a matter of the commonest observation how soon even ordinary Dogs learn to understand certain words or phrases, such as "Rats!" "Cats!" "Set them off!" "Beg!" "Trust!" and so forth; and, although certainly in many of these cases tone and gesture have a great deal to do with the animal's comprehension, yet there can be no sort of doubt that a Dog of fair intelligence learns, after a time, to recognise the words, if spoken in the most ordinary tone of voice. The following account—a truly marvellous one—illustrates not only the most perfect understanding of words, but capacity for a high degree of education, great intelligence, extensive memory, and reasoning faculties of no mean order:—

"Two fine Dogs, of the Spanish breed, were introduced by M. Léonard, with the customary French *politesse*, the largest by the name of M. Philax, the other as M. Brac (or Spot). The former had been in training three, the latter two, years. They were in vigorous health, and having bowed very gracefully, seated themselves on the hearth-rug side by side. M. Léonard then gave a lively description of the means he had employed to develop the cerebral system in these animals—how, from having been fond of the chase, and ambitious of possessing the best trained Dogs, he had employed the usual course of training—how the conviction had been impressed on his mind that by gentle usage, and steady perseverance in inducing the animal to repeat again and again what was required, not only would the Dog be capable of performing that specific act, but that part of the brain which was brought into activity by the mental effort would become more largely developed, and hence a permanent increase of mental power be obtained.

"After this introduction, M. Léonard spoke to his Dogs in French, in his usual tone, and ordered one of them to walk, the other to lie down, to run, to gallop, halt, crouch, &c., which they performed as promptly and correctly as the most docile children. Then he directed them to go through the usual exercises of the *manège*, which they performed as well as the best trained ponies at Astley's.

"He next placed six cards of different colours on the floor, and, sitting with his back to the Dogs, directed one to pick up the blue card, and the other the white, &c., varying his orders rapidly, and speaking in such a manner that it was impossible the Dogs could have executed his commands if they had not had a perfect knowledge of the words. For instance, M. Léonard said, 'Philax, take the red card and give it to Brac, and, Brac, take the white card and give it to Philax.' The Dogs instantly did this, and exchanged cards with each other. He then said, 'Philax, put your card on the green, and Brac, put yours on the blue;' and this was instantly performed. Pieces of bread and meat were placed on the floor, with figured cards, and a variety of directions were given to the Dogs, so as to put their intelligence and obedience to a severe test. They brought the meat, bread, or cards, as commanded, but did not attempt to eat or to touch unless ordered. Philax was then ordered to bring a piece of meat and give it to Brac, and then Brac was told to give it back to Philax, who was to return it to its place. Philax was next told he might bring a piece of bread and eat it; but, before he had time to swallow it, his master forbade him, and directed him to show that he had not disobeyed, and the Dog instantly protruded the crust between his lips.

"While many of the feats were being performed, M. Léonard snapped a whip violently, to prove that the animals were so completely under discipline, that they would not heed any interruption. After many other performances, M. Léonard invited a gentleman to play a game of dominoes with one of them. The younger and slighter Dog then seated himself on a chair at the table, and the writer and M. Léonard seated themselves opposite. Six dominoes were placed on their edges in the usual manner before the Dog, and a like number before the writer. The Dog, having a double number, took one up in his mouth, and put it in the middle of the table; the writer placed a corresponding piece on one side; the Dog immediately played another correctly, and so on until all the pieces were engaged. Other six dominoes were then given to each, and the writer intentionally played a wrong number. The Dog looked surprised, stared very earnestly at the writer, growled, and finally barked angrily. Finding that no notice was taken of his remonstrances, he pushed away the wrong domino with his nose, and took up a suitable one from his own pieces and placed it in its stead. The writer then played correctly; the Dog followed, and won the game. Not the slightest intimation could have been given by M. Léonard to the Dog. This mode of play must have been entirely the result of his own observation and judgment. It should be added that the performances were strictly private. The owner of the Dogs was a gentleman of independent fortune, and the instruction of his Dogs had been taken up merely as a curious and amusing investigation."*

To give another instance of a Dog understanding actual words:—A woman expressed aloud a wish that a certain Cat, who plagued her greatly, was dead. Her favourite Dog went out of the house, found the Cat in the garden, and immediately slew it! This is quite a parallel case to the story of Henry II. and Thomas à Becket.

Another very unequivocal instance is given us by Mr. Hugh Miller. Pompey, a black Retriever, belonging to a lady at Morningside, Edinburgh, could not be kept because he was perpetually damaging the neighbours' gardens. He was, therefore, sent to lodge with the family of an old servant, but there, too, he made his position untenable by fighting with the servant's own Dog. At last, it was agreed that there was no use in trying to cure Pompey of his bad habits; he was condemned to death, and the butcher was ordered to hang him on a certain day. The children, who loved the poor beast, despite his crimes, kept throwing their arms round his neck and saying, "Oh, poor Pompey, you're going to be hanged!" On the morning fixed for the execution Pompey disappeared, and kept clear until he imagined the storm had blown over. Another day was, therefore, fixed, but before that time the servant at whose house he was stopping mentioned Pompey's case to a lady, who obtained a reprieve, and adopted him herself. He behaved very well with his new mistress for some time, although for a full year after his rescue he was much depressed in spirits, and wore quite a hang-dog look. But after some years, there was a general change of servants in the house, and Pompey, who disliked strangers, bit one of the new-comers. His mistress—without meaning a threat—said to him, "Oh, Pompey, you'll be hanged after all!" whereupon Pompey decamped, and could by no means be heard of. At length, an advertisement in the *Scotsman* was answered by a gentleman, who stated that an ownerless Dog, of the description given, had been caught *changing trains* at Layton, Cumberland. Here he was detained, and, although at home rather averse to strangers, displayed at once extraordinary urbanity, and was soon a prime favourite. Evidently it was his intention to ingratiate himself with his new friends, that he might not be sent home and hanged. Subsequently, he was identified by a friend of his mistress's who was travelling in Cumberland, and sent home. Besides illustrating a Dog's knowledge of words, this anecdote furnishes a wonderful instance of acuteness, for this Dog knew nothing of the railway by which he travelled to Layton, except from having a short time before accompanied the cook to the station to see her off on a journey.

After finding that the Dog can understand what is said to him, one is always tempted to wish he could go one step further, and answer again, for to hear from a Dog's own lips his opinion on "men and things" would be an entertainment of no small interest. Attempts have been made to teach Dogs to speak, but as one might imagine with very partial success. A curious account of an attempt of this kind was communicated by the great philosopher Leibnitz to the French Academy.

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* Youatt.

"A little boy, a peasant's son, imagined that he perceived in the Dog's voice an indistinct resemblance to certain words, and therefore took it into his head to teach him to speak. For this purpose he spared neither time nor pains with his pupil, who was about three years old when his learned education commenced, and in process of time he was able to articulate no fewer than thirty distinct words. He was, however, somewhat of a truant, and did not very willingly exert his talent, and was rather pressed than otherwise into the service of literature. It was necessary that the words should be pronounced to him each time, and then he repeated them after his preceptor. Leibnitz attests that he heard the animal talk in this way, and the French Academicians add, that unless they had received the testimony of so celebrated a person they would scarcely have dared to report the circumstance. It took place in Mesnia, in Saxony." *

But "actions speak louder than words," and although the Dog is not gifted with the power of articulate speech, he is yet capable of expressing his feelings by look and gesture as eloquently as most people. It is altogether wonderful to see how a Dog's whole expression and demeanour are changed by a word or look either of praise or blame. The eye, the mouth, the ear, the tail, the whole trunk, all are called into requisition, and together speak a language which is unmistakable. Mr. Darwin gives a most interesting account of the mode of expression of two opposite states of mind in the Dog; an account which, like everything written by the same author, leaves nothing to be desired for clearness and accuracy.

BLACK RETRIEVER.

"When a Dog approaches a strange Dog or man in a savage or hostile frame of mind, he walks upright and very stiffly; his head is slightly raised, or not much lowered, the tail is held erect and quite rigid; the hairs bristle, especially along the neck and back; the pricked ears are directed forwards, and the eyes have a fixed stare. These actions follow from the Dog's intention to attack his enemy, and are thus to a large extent intelligible. As he prepares to spring, with a savage growl, on his enemy, the canine teeth are uncovered, and the ears are pressed close backwards on the head. Let us now suppose that the Dog suddenly discovers that the man whom he is approaching is not a stranger, but his master; and let it be observed how completely and instantaneously his whole bearing is reversed.

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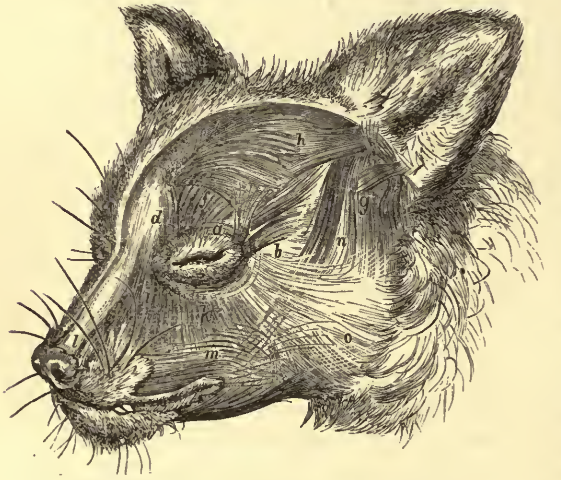
* Youatt.

Instead of walking upright, the body sinks downwards, or even crouches, and is thrown into flexuous movements; his tail, instead of being held stiff and upright, is lowered and wagged from side to side; his hair instantly becomes smooth; his ears are depressed and drawn backwards, but not closely to the head; and his lips hang loosely. From the drawing back of the ears the eyelids become elongated, and the eyes no longer appear round and staring."

And again, "when a Dog is on the point of springing on his antagonist, he utters a savage growl; the ears are pressed closely backwards, and the upper lip is retracted out of the way of his teeth, especially of his canines. . . . If a Dog only snarls at another, the lip is generally retracted on one side alone, namely, towards his enemy."

"The feeling of affection of a Dog towards his master is combined with a strong sense of submission, which is akin to fear. Hence Dogs not only lower their bodies and crouch a little as they approach their masters, but sometimes throw themselves on the ground, with their bellies upwards. This is a movement as completely opposite as is possible to any show of resistance. . . . A pleasurable and excited state of mind, associated with affection, is exhibited by some Dogs in a very peculiar manner, namely, by grinning."*

It is extremely interesting to consider the means by which these various expressive movements are produced. If the skin be removed from the head of a Dog, there will be seen, lying beneath it, a quantity of red flesh, intermixed with a good deal of fat and fibrous substance. If this latter be carefully dissected away, the red flesh will be seen to resolve itself into a number of *muscles*, very definitely arranged, and each one designed for some special movement. There are, first of all, muscles which move the eye. One set of fibres closely encircle the aperture of the eyelids, and, when they act, close the eye, either entirely, as in actual sleep, or partially, as in that half sleepy state a Dog loves to be in on a hot afternoon, or before a blazing fire. Another set of eye muscles have an entirely different action to these. They radiate from the eyelids to the surrounding parts of the head, and when they act, "draw back the eyelids from the eyeball, and give a sparkling fierceness to the eye." From this reason Sir Charles Bell, who first described them, called them *scintillantes*, or sparkling muscles. The ears have a number of muscular bands attached to them, some drawing them forwards, some backwards, others sideways. These are, therefore, highly important muscles, for a Dog hardly passes a moment without moving his ears. We ourselves possess representatives of these muscles, but in an entirely useless state in most persons, very few having the power of moving their ears. Other very important muscles pass from one of the face bones in front of the eye, and are attached to the lip just above the canine teeth. When these act, they draw the lips back from those teeth, thus baring the Dog's chief weapon, and producing a snarl; they are, therefore, called the *ringentes*, or snarling muscles; and one has only to irritate a Dog to see their effect in altering the animal's expression. Lastly, there are muscles which draw back the corners of the mouth and produce a sort of grin, an action which seems to be almost normal in the Wolf, but which is also frequently seen in Dogs. It will be readily observed how important these muscles are, and how every expressive look in a Dog's countenance can be referred to the action of one or more of them.



MUSCLES OF DOG'S HEAD. (*After Sir C. Bell.*)

a, Circular muscle round the eyelids; *b*, *d*, scintillantes; *f*, *g*, *h*, muscles of the ear; *i*, *k*, ringentes; *m*, circular fibres of the mouth; *n*, muscle drawing back the angle of the mouth; *o*, cutaneous muscle, for moving the skin of the neck.

There can be no doubt that Dogs are perfectly capable of communicating their thoughts to one another, and of understanding one another's meaning as well as that of their masters. One often sees two Dogs, after a friendly sniff, carry on a small conversation, before trotting on their ways, evidently quite as fond of a little chat as Burns's celebrated "twa Dogs," who

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* Darwin's "Expression of the Emotions."

"Foregather'd ance upon a time
* * * *
Nae doubt but they were fain o' ither,
An' unco pack and thick thegither;
Wi' social nose whyles snuff'd and snowkit;
Whyles mice and moudieworts * they howkit;
Whyles scour'd awa in lang excursion,
An' worry'd ither in diversion;
Until wi' daffin weary grown,
Upon a knowe they sat them down,
And there began a lang digression
About the lords o' the creation."

The method of hunting in packs adopted by wild Dogs is an undoubted proof of the faculty of combining together for a definite end, a number of animals agreeing to hunt a quarry, which one alone would be powerless against. But there are many instances of civilised Dogs concocting plans in the cleverest way, and carrying them out with a care and circumspection perfectly wonderful in a "dumb animal." For instance, Mr. Romanes says:—"A small Skye and a large Mongrel were in the habit of hunting Hares and Rabbits upon their own account, the small Dog having a good nose, and the large one great fleetness. These qualities they combined in the most advantageous manner, the Terrier driving the game from the cover towards his fleet-footed companion, which was waiting for it outside." The same gentleman gives another and still more curious instance:—

"A friend of mine in this neighbourhood had a small Terrier and a large Newfoundland. One day a shepherd called upon him to say that his Dogs had been seen worrying Sheep the night before. The gentleman said there must be some mistake, as the Newfoundland had not been unchained. A few days afterwards the shepherd again called with the same complaint, vehemently asserting that he was positive as to the identity of the Dogs. Consequently, the owner set one watch upon the kennel, and another outside the sheep enclosure, directing them (in consequence of what the shepherd had told him) not to interfere with the actions of the Dogs. After this had been done for several nights in succession, the small Dog was observed to come at day-dawn to the place where the large one was chained. The latter immediately slipped his collar, and the two animals made straight for the Sheep. Upon arriving at the enclosure, the Newfoundland concealed himself behind a hedge, while the Terrier drove the Sheep towards his ambush, and the fate of one of them was quickly sealed. When their breakfast was finished, the Dogs returned home, and the large one, thrusting his head into his collar, lay down again as though nothing had happened. Why this animal should have chosen to hunt by stratagem prey which he could so easily have run down I cannot suggest; but there is little doubt that so wise a Dog must have had some good reason."

In another case we have met with, a "solemn league and covenant" was made, for purposes of offence and defence, between a Dog and a Cat. A Blenheim Spaniel was taken to a strange house, and, shortly after his arrival, was attacked and severely scratched by the two Cats living there. The Spaniel was no match for both antagonists at once, and so judiciously beat a retreat into the garden. He there met with a Cat belonging to the gardener, and succeeded in making friends with her and prevailing on her to join with him against his cruel enemies. The two allies then went into the house, and finding one of the victorious Cats alone, attacked and defeated her. Shortly after she was put to flight, victor number two entered the room; she was also presently attacked and routed with great loss by the allied forces, who were thus left masters of the field. The narrator of this tale goes on to state that the Spaniel remained ever afterwards on terms of the firmest friendship with his feline helper.

It is a subject of great interest to consider which of the virtues and vices of man himself are exhibited by the Dog. We will take, first, his good qualities, and then shall "follow his vices—close at the heels of his virtues;" so that we may see how many of both he can be found to possess.

First, and most important of all, is a clear sense of right and wrong, without which no moral advancement is possible. That nearly all Dogs have this sense, and that many possess it in a very marked degree, there can be no doubt. Several instances of this faculty are given by the author we have already quoted, Mr. G. J. Romanes,* who writes of a little Dog in his possession :—

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* Moles.

"For a long time this Terrier was the only canine pet I had. One day, however, I brought home a large Dog, and chained him up outside. The jealousy of the Terrier towards the new-comer was extreme. Indeed, I never before knew that jealousy in an animal could arrive at such a pitch; but as it would occupy too much space to enter into details, it will be enough to say that I really think nothing that could have befallen this Terrier would have pleased him so much as would any happy accident by which he might well get rid of his rival. Well, a few nights after the new Dog had arrived, the Terrier was, as usual, sleeping in my bed-room. About one o'clock in the morning he began to bark and scream very loudly, and upon my waking up and telling him to be quiet, he ran between the bed and the window in a most excited manner, jumping on and off the toilette-table after each journey, as much as to say: 'Get up quickly; you have no idea of what shocking things are going on outside!' Accordingly I got up and was surprised to see the large Dog careering down the road: he had broken loose, and, being wild with fear at finding himself alone in a strange place, was running he knew not whither. Of course I went out as soon as possible, and after about half-an-hour's work succeeded in capturing the runaway. I then brought him into the house and chained him up in the hall; after which I fed and caressed him, with the view of restoring his peace of mind. During all this time the Terrier had remained in my bed-room, and, although he heard the feeding and caressing process going on down-stairs, this was the only time I ever knew him fail to attack the large Dog when it was taken into the house. Upon my re-entering the bed-room, and before I had said anything, the Terrier met me with certain indescribable grinnings and prancings, which he always used to perform when conscious of having been a particularly good Dog. Now, I consider the whole of this episode a very remarkable instance in an animal of action prompted by a sense of *duty.* No other motive than the voice of conscience can here be assigned for what the Terrier did: even his strong jealousy of the large Dog gave way before the yet stronger dread he had of the remorse he knew he should have to suffer if next day he saw me distressed at a loss which it had been in his

ITALIAN GREYHOUND.

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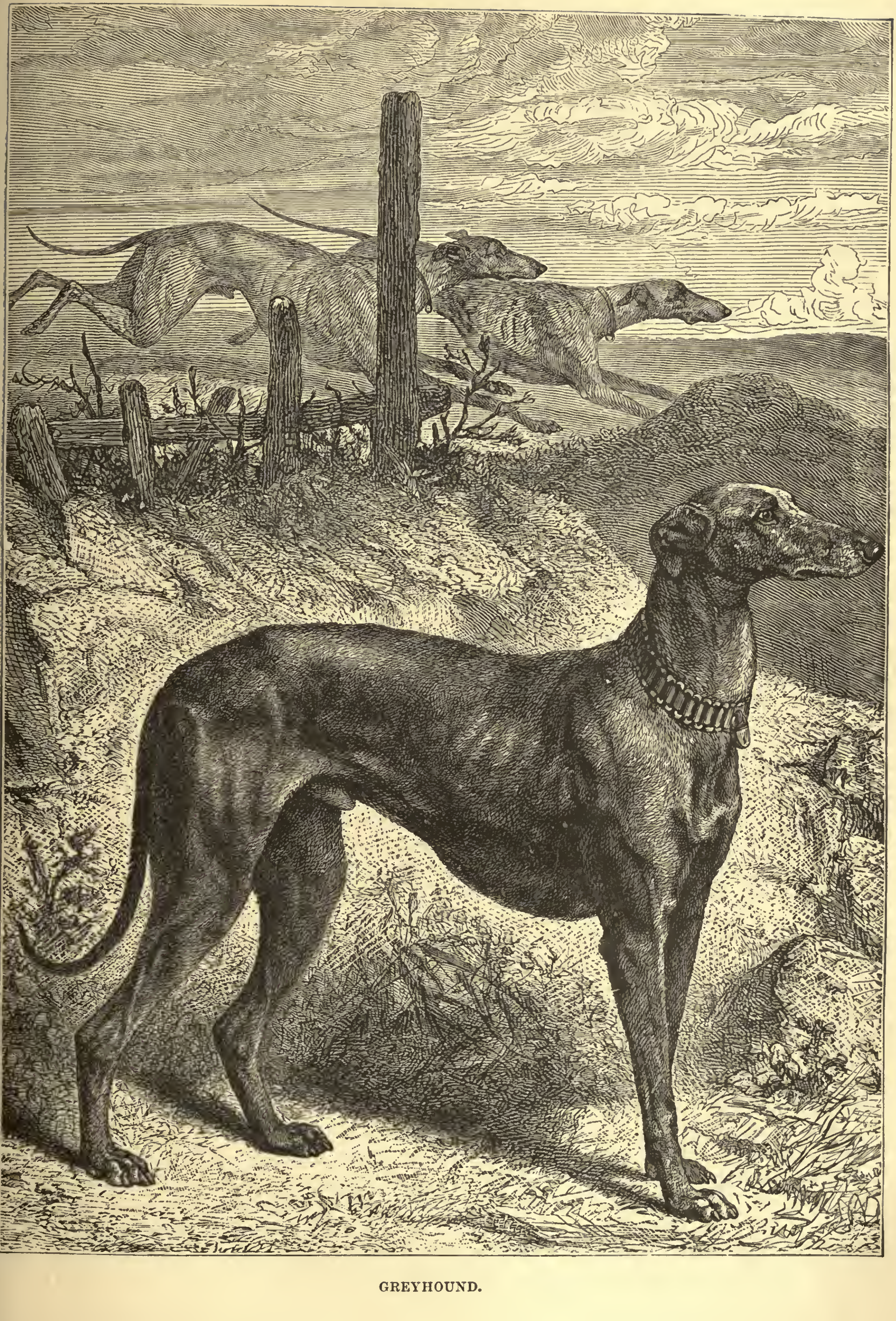
* *Quarterly Journal of Science*, April, 1876.



GREYHOUND.

power to prevent. What makes the case more striking is, that this was the only occasion during the many years he slept in my bed-room that the Terrier disturbed me in the night-time. Indeed, the scrupulous care with which he avoided making the least noise while I was asleep, or pretending to be asleep, was quite touching: even the sight of a Cat outside, which at any other time rendered him frantic, only causing him to tremble violently with suppressed emotion, when he had reason to suppose that I was not awake. If I overslept myself, however, he used to jump upon the bed and push my shoulder gently with his paw.

"The following instance is likewise very instructive. I must premise that the Terrier in question far surpassed any animal or human being I ever knew in the keen sensitiveness of his feelings, and that he was never beaten in his life. Well, one day he was shut up in a room by himself, while everybody else in the house where he was went out. Seeing his friends from the window as they departed, the Terrier appears to have been overcome by a paroxysm of rage, for when I returned I found that he had torn all the bottoms of the window-curtains to shreds. When I first opened the door he jumped about as Dogs in general do under similar circumstances, having apparently forgotten, in his joy at seeing me, the damage he had done. But when, without speaking, I picked up one of the torn shreds of the curtains, the Terrier gave a howl, and rushing out of the room, ran up-stairs screaming as loudly as he was able. The only interpretation I can assign to this conduct is, that his former fit of passion having subsided, the Dog was sorry at having done what he knew would annoy me; and not being able to endure in my presence the remorse of his smitten conscience, he ran to the farthest corner of the house, crying *peccavi* in the language of his nature.

"I had had this Dog for several years, and had never—even in his puppyhood—known him to steal. On the contrary, he used to make an excellent guard to protect property from other animals, servants, &c., even though these were his best friends. Nevertheless, on one occasion he was very hungry, and in the room where I was reading and he was sitting there was, within easy reach, a savoury mutton chop. I was greatly surprised to see him stealthily remove this chop and take it under a sofa. However, I pretended not to observe what had occurred, and waited to see what would happen next. For fully a quarter of an hour this Terrier remained under the sofa without making a sound, but doubtless enduring an agony of contending feelings. Eventually, however, conscience came off victorious, for, emerging from his place of concealment, and carrying in his mouth the stolen chop, he came across the room and laid the tempting morsel at my feet. The moment he dropped the stolen property he bolted again under the sofa, and from this retreat no coaxing could charm him for several hours afterwards. Moreover, when during that time he was spoken to or patted, he always turned away his head in a ludicrously conscience-stricken manner. Altogether, I do not think it would be possible to imagine a more satisfactory exhibition of conscience by an animal than this; for it must be remembered, as already stated, that the particular animal in question was never beaten in its life."

That extreme sensitiveness, so often an attribute of the highest kinds of mind, was developed to an extraordinary degree in this wonderful Terrier. His owner says:—"A reproachful word or look from me, when it seemed to him that occasion required it, was enough to make this Dog miserable for a whole day. I do not know what would have happened had I ventured to strike him; but once, when I was away from home, a friend used to take him out every day for a walk in the park. He always enjoyed his walks very much, and was now wholly dependent on this gentleman for obtaining them. (He was once stolen in London, through the complicity of my servants, and never after that would he go out by himself, or with any one whom he knew to be a servant.) Nevertheless, one day, while he was amusing himself with another Dog in the park, my friend, in order to persuade him to follow, struck him with a glove. The Terrier looked up at his face with an astonished and indignant gaze, deliberately turned round, and trotted home. Next day he went out with my friend as before, but after he had gone a short distance, he looked up at his face significantly, and again trotted home with a dignified air. After this, my friend could never induce the Terrier to go out with him again. It is remarkable, also, that this animal's sensitiveness was not only of a selfish kind, but extended itself in sympathy for others. Whenever he saw a man striking a Dog, whether in the house or outside, near at hand or at a distance, he used to rush to the protection of his fellow, snarling and snapping in a most threatening way. Again, when driving with me in a dog-cart, he always used to seize the sleeve of my coat every time I touched the Horse with the whip."

Sensitiveness such as this generally goes along with the keenest susceptibility to ridicule; and here, again, the same Dog showed a dislike of being laughed at which is amusingly human, as is also the clever trick by which he tried to escape the gibes which were entering so deeply into his soul.

"The Terrier used to be very fond of catching flies upon the window-panes, and if ridiculed when unsuccessful, he was evidently much annoyed. On one occasion, in order to see what he would do, I purposely laughed immoderately every time he failed. It so happened that he did so several times in succession—partly, I believe, in consequence of my laughing; and eventually he became so distressed that he positively *pretended* to catch the fly, going through all the appropriate actions with his lips and tongue, and afterwards rubbing the ground with his neck as if to kill the victim; he then looked up at me with a triumphant air of success. So well was the whole process simulated, that I should have been quite deceived had I not seen that the fly was still upon the window. Accordingly I drew his attention to this fact, as well as to the absence of anything upon the floor; and when he saw that his hypocrisy had been detected, he slunk away under some furniture, evidently much ashamed of himself."

Honesty is a virtue very commonly developed in good Dogs, and instances of it are numerous. In the family of a friend of ours there is a large Retriever—a long-faced, Puritanical-looking Dog—which, when the temptation to steal is ready to overpower him, will, to keep his virtue untarnished, turn his back upon the longed-for morsel, solemnly looking in the opposite direction. Evidently, like Coleridge's "holy hermit," he "prays where he does sit," and thus overcomes the temptation. But, as usual, the best anecdote is given by Mr. Romanes, again *apropos* of his wonderful Terrier.

"I have seen this Dog escort a Donkey, which had baskets on its back filled with apples. Although the Dog did not know that he was being observed by anybody, he did his duty with the utmost faithfulness; for every time the Donkey turned back its head to take an apple out of the baskets the Dog snapped at its nose; and such was his watchfulness, that, although his companion was keenly desirous of tasting some of the fruit, he never allowed him to get a single apple during the half-hour they were left together. I have also seen this Terrier protecting meat from other Terriers (his sons) which lived in the same house with him, and with which he was on the best of terms. More curious still, I have seen him seize my wristbands while they were being worn by a friend to whom I had temporarily lent them."

In some Dogs, as in many people, honesty does not spring from high principle, but from mere conventionality. Actual dishonesty, too, is the commonest vice of untrained or badly-trained Dogs. It is, however, comparatively rare to meet with Dogs whose thefts are of a really artistic nature. Two of the best instances of this are furnished by Sir Walter Scott,* who gives a most interesting account of a Shepherd's Dog and a Spaniel, both of whom had a perfect talent for thieving; they were not only afflicted with kleptomania in a high degree, but showed as much talent in the performance of their equivocal deeds as the most prominent member of the "swell mob."

"I have heard of a sheep-stealer who had rendered his Dog so skilful an accomplice in his nefarious traffic, that he used to send him out to commit acts of felony by himself, and had even contrived to impress on the poor cur the caution that he should not, on such occasions, seem even to recognise his master if they met accidentally. There were several instances of this dexterity, but especially those which occurred in the celebrated case of Murdison and Millar in 1773. These persons, a sheep-farmer and his shepherd, settled in the vale of Tweed, commenced and carried on for some time an extensive system of devastation on the flocks of their neighbours. A Dog belonging to Millar was so well trained that he had only to show him during the day the parcel of Sheep which he desired to have, and when dismissed at night for the purpose, Yarrow went right to the pasture where the flock had fed, and carried off the quantity shown to him. He then drove them before him by the most secret paths to Murdison's farm, where the dishonest master and servant were in readiness to receive the booty. Two things were remarkable. In the first place, that if the Dog, when thus dishonestly employed, actually met his master, he observed great caution in recognising him, as if he had been afraid of bringing him under suspicion; secondly, that he showed a distinct sense that the illegal transactions in which he was engaged were not of a nature to endure daylight. The Sheep which he

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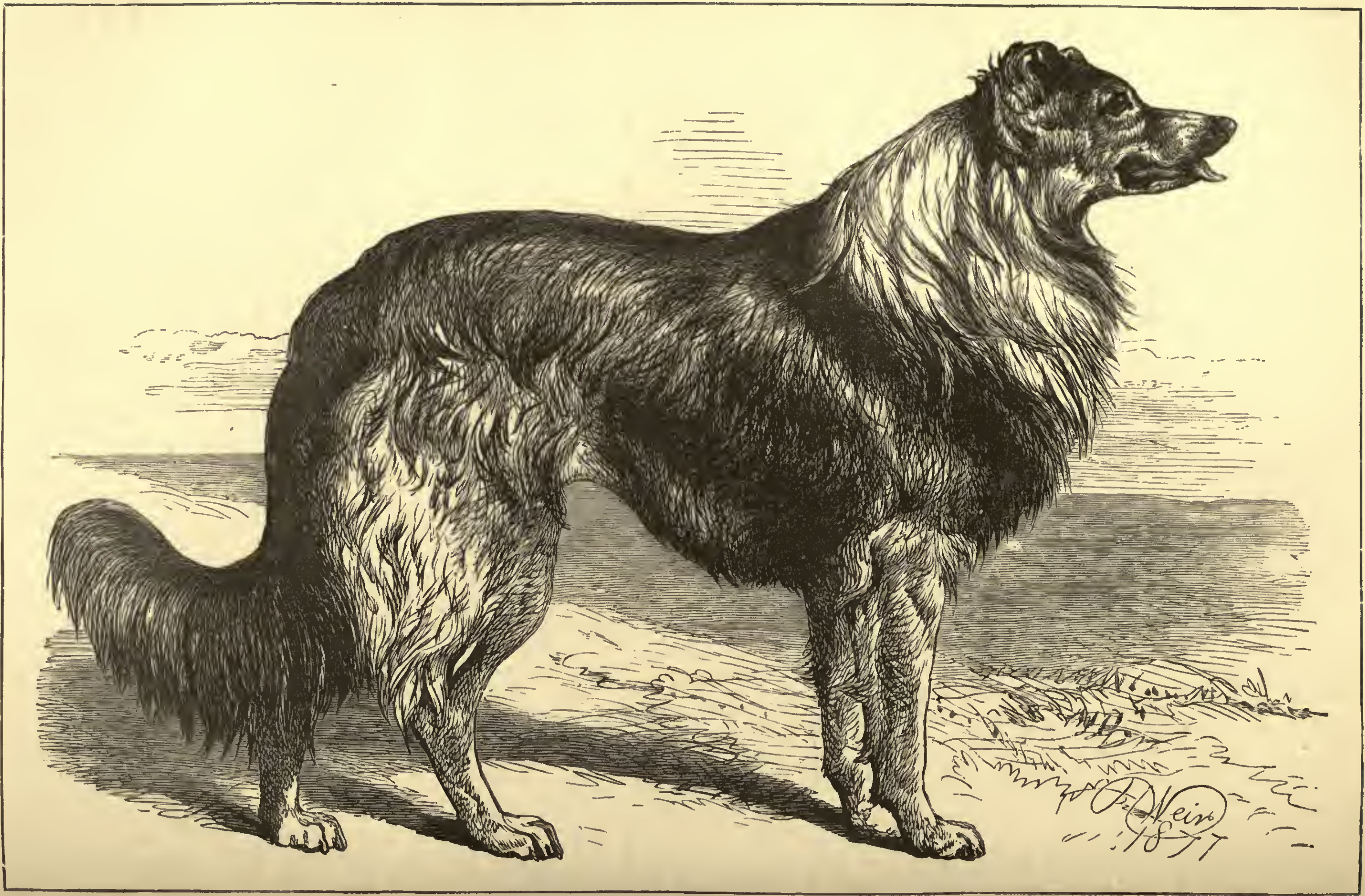
* "St. Ronan's Well."



COLLEY, OR SHEEP DOG.

was directed to drive were often reluctant to leave their own pastures, and sometimes the intervention of rivers or other obstacles made their progress peculiarly difficult. On such occasions, Yarrow continued his efforts to drive his plunder forward until the day began to dawn, a signal which, he conceived, rendered it necessary for him to desert his spoil, and slink homeward by a circuitous road. It is generally said this accomplished Dog was hanged along with his master; but the truth is, he survived him long, in the service of a man in Leithen: yet was said afterwards to have shown little of the wonderful instinct exhibited in the service of Millar.

"Another instance of similar sagacity a friend of mine discovered in a beautiful little Spaniel, which he had purchased from a dealer in the canine race. When he entered a shop, he was not long in observing that his little companion made it a rule to follow at some interval, and to estrange itself from his master so much as to appear totally unconnected with him. And when he left the shop, it was the Dog's custom to remain behind him till it could find an opportunity of seizing a pair of gloves, or silk stockings, or some similar property, which it brought to its master. The poor fellow probably saved its life by falling into the hands of an honest man."

NEWFOUNDLAND DOGS.

Equally good is the account given by Mr. Youatt of a pair of canine house-lifters, whose talents were really pre-eminent. One is almost tempted to wonder if an iron safe with all the most recent improvements would have been proof against their attacks.

"The writer of this work had a brace of Greyhounds as arrant thieves as ever lived. They would now and then steal into the cooking-room belonging to the kennel, lift the lid from the boiler, and, if any portion of the joint or piece of meat projected above the water, suddenly seize it, and before there was time for them to feel much of its heat, contrive to whirl it on the floor, and eat it at their leisure as it got cold. In order to prevent this, the top of the boiler was secured by an iron rod passing under its handle, and tied to the handle of the boiler on each side; but not many days passed ere they discovered that they could gnaw the cords asunder, and displace the rod, and fish out the meat as before. Small chains were then substituted for the cords, and the meat was cooked in safety for nearly a week, when they found that, by rearing themselves on their hind legs, and applying their united strength towards the top of the boiler, they could lift it out of its bed, and roll it along the floor, and so get at the broth, although the meat was out of their reach. The man who looked after them expressed himself heartily glad when they were gone; for he said he was often afraid to go into the kennel, and was sure they were devils and not Dogs."

The foregoing Dogs were all dishonest in a tolerably open sort of way, and are comparable to human burglars and shop-lifters; but the animal of whom the following tale is told disdained plain dealing, and went in for something akin to the well-known "confidence dodge," by which so many unsuspecting countrymen are every year taken in by London sharpers:—

"I once, under somewhat singular circumstances, made the acquaintance of a Dog, as arrant a vagabond and impostor as ever ran on four legs, but whose shortcomings were, I feel convinced, occasioned by circumstances entirely beyond his control. He was above the medium size, and of handsome proportions, except for one or two blemishes. There was an air of superior breeding about the animal; his coat was silky and genteel, and his bright eyes beamed with intelligence. Owing, however, to an accident of birth, a taint of the most objectionable cur kind had crept into his composition. It announced itself in distorting to bandiness his otherwise symmetrical fore-legs, and in a shapeless, club-like tail, which usurped the place of a wavy, graceful terminal appendage such as would have been his had not his breed been marred. A close observer might have remarked, as well as the peculiarities mentioned, a raffish drooping of the left eyelid and an up-curving of the upper lip on the right side, as though the animal had been used to pot-house company, and they had taught him the trick of holding a short pipe there. But, on the whole, and at a cursory glance, he was quite a nice-looking Dog.

"The first occasion of our meeting was very late one wintry night, when the snow lay half a foot deep on the street pavement. I cannot say if he first caught sight of me or I of him, for he was crouched in the shadow of a lamp-post, seemingly on the chance of there coming that way a compassionate pedestrian who might be induced to give him a night's lodging. Our eyes met, and had I been a long-lost relative he could not have been more suddenly inspired with joy. He bounded to his feet, and proclaimed his good-luck in tones that must have awakened all the babies in the neighbourhood. I quickened my step, but he appeared to regard this as a friendly response to his friskiness, and he barked the louder. For peace' and quietness' sake I adjured him as 'Good Dog.' That did the business. He had no objection to trotting soberly by my side on that understanding, and so together we arrived at my domicile.

"It was altogether against the rules of the establishment to admit strange Dogs, but under such circumstances what could I do? His genteel appearance pleaded for him. The mere fact of his having, like a blundering, stupid, honest tyke, jumped to the conclusion that I looked just the sort of man to befriend a houseless Dog, spoke in his favour. Every one was in bed as I opened the door with my latch-key, and not too deeply to compromise myself I pointed out to my canine intruder that his place for the night was the door-mat. I went down-stairs and searched for scraps, and got him together a tolerably good supper, and left him perfectly comfortable.

"I cannot believe that at that time he had it in his mind to abuse my confidence, or to act towards me in any way the reverse of honourable. It must have been that unfortunate one-eighth of cur that, made bold by beef-bones, rose against the animal's better nature, and conquered it. Anyhow, when the outer door was opened to the newspaper-boy next morning, the servant was scared by the spectacle of a Dog taking the whole flight of steps at a leap, and making off with part of a leg of pork in its mouth. The villain had feloniously extracted it from the pantry, which I had inadvertently left open when I went foraging for him. Besides the pork he had carried off, he had helped himself during the night to a small steak-pie, about a pound of fresh butter, and a fine rasher of ham. I had but little expectation of encountering the canine traitor ever again; but I did so. About a week after, at dead of night, and in the pouring rain, once more I made out his crouching figure in the shadow of the identical lamp-post. Again our eyes met, and, as on the previous occasion, he instantly leapt to his feet. Not to cut capers about me. However, his guilty fears did not make of him a faltering, trembling coward. He took in the whole situation at a glance, including my vengefully-grasped umbrella, and, with one brisk bark of derision, made off at a speed which quickly carried him out of sight. Since then I have frequently encountered him, but it has been in the busy streets at daytime, but he does not run away. If he can avoid my eye he does so. If he cannot—and with his guilt haunting him I imagine it is not easy to do so—he assumes a puzzled expression of countenance, as though half convinced he has seen me before, though when and under what circumstances he could not say though his life depended on it."*

Another very good instance of cunning, produced by a long course of back-slum life and manners, is given by the writer from whom the foregoing anecdote is taken, respecting "a Dog—a low-looking villain, blind of one eye, and, in consequence of his nefarious propensities, with never more than three sound legs to run on, who haunts the neighbourhood of Drury Lane. Nobody owns the brute, but he has contrived to scrape acquaintance with a kind-hearted cheesemonger, who keeps a shop there. I have the worthy tradesman's own word for it that he always knows when the officer on the look-out for vagrant Dogs is about by the sudden appearance of Tinker and his peculiar behaviour. At ordinary times disdaining to be anything better than a Dog of the streets, his custom is to salute the cheesemonger from the pavement, and by a bark and a wag of his stump of a tail solicit an unconsidered trifle of bone or bacon-rind; but on the special occasion alluded to his tactics are quite different. He enters the shop with a sober and business-like air, and lies down on a mat by the parlour-door, with paws extended and his tail beating a contented tattoo on the floor, as though since his puppyhood that had been his home and abiding-place, and he had known and desired to know no other. It is a joke between the officer and the cheesemonger, and the former enters the shop and loudly demands to know if 'that Dog lives here.' I have not as yet had the pleasure of witnessing it, but the cheesemonger informs me that it is 'as good as a play' to observe the reassuring blink of his only eye which, at this juncture, Tinker bestows on the policeman, immediately afterwards curling himself round for a doze, as though to say, 'Let this convince you.' Tinker's stay, however, is not protracted. As soon as, according to his calculation, the coast is clear, he is off, as unexpectedly as he came, and until he is again hard pressed by the law never thinks of crossing the cheesemonger's threshold."

We spoke just now of Dogs being honest from pure conventionality; there is no doubt that many of them soon acquire a very acute sense of the conventional, and perform certain actions, or assume a certain behaviour, simply because they feel it to be the right and proper thing. We have heard of a Bull-terrier who acquired perfectly that sense of decorum which in many human beings serves in lieu of religious feeling. When this Dog was bought, it was debated whether or not it would be advisable to let him remain in the room at prayers; the question was eventually decided in the affirmative, and the Dog almost immediately seemed to get a sense of what was meant, and to feel that he was expected to behave with propriety. He therefore adopted a particular mode of procedure—a sort of canine ritual—to which he always steadily adhered. While the Bible was being read, he sat straight up on his haunches on the hearth-rug, looking solemnly into the fire. This he continued until the family knelt to pray, when he immediately went off to a corner of the room, and stood there with lowered head until all was over. He did this with such perfect solemnity that the effect was indescribably ludicrous, and friends stopping in the house had to be warned of what to expect.

The tales of canine magnanimity are endless. Every one knows that of the big Newfoundland who, being long plagued by a number of little yelping curs, one of whom at last bit him, revenged himself only by dipping the offender in the quay hard by, and, after he was cowed, plunging in and bringing him safe to land. But all Dogs are not magnanimous. Some of them, like certain men one meets with, have quite a talent for taking offence, and will pick a quarrel on the slightest provocation, or, indeed, on no provocation at all. There are, of course, the wretched little curs one meets in the street, whose sole delight seems to be to rush out suddenly and bark furiously at every passer-by; but these miserable beings act as they do rather from lack of brain, and for want of something to do, than from real badness of heart. There are Dogs, however, who are naturally quarrelsome, and will do all in their power to get up a row, simply for the pleasure of the thing. "There is a well-authenticated instance of a Terrier, who, in picking a quarrel, contrived, as if trained in the Kanzellei of Prince Bismarck, to place himself technically in the right. He would time his movements so that some passenger should stumble over him, and would then fasten on the calf of his leg. With a most statesman-like aptitude, he selected the aged, the infirm, and the ill-dressed, as the objects of his cunningly-planned attacks."†

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* From the *Globe* newspaper.

† "Animal Depravity," *Quarterly Journal of Science*, 1875.

Not only are instances of quarrelsomeness to be found in Dogs, but also of the strongest desire to revenge real or supposed injuries, of the exercise of a wonderful amount of cunning and reasoning power to bring a hated rival to justice. The following anecdote forms a capital antithesis to that of Mr. Romanes' Terrier, who prevented the escape of the Dog he disliked and was jealous of, although such an event would have brought him the greatest possible comfort :—

"A fine Terrier, in the possession of a surgeon, about three weeks ago, exhibited its sagacity in a rather amusing manner. It came into the kitchen and began plucking the servant by the gown, and in spite of repeated rebuffs, it perseveringly continued in its purpose. The mistress of the house hearing the noise, came down to inquire the cause, when the animal treated her in a similar manner. Being struck with the concern evinced by the creature, she quietly followed it up-stairs into a bed-room, whither it led her; there it commenced barking, looking under the bed, and then up in her face. Upon examination, a Cat was discovered there quietly demolishing a beef-steak, which it had feloniously obtained. The most singular feature in the whole case is that the Cat had been introduced into the house only a short time before, and that bitter enmity prevailed between her and her canine companion."

Besides illustrating the desire for vengeance, this is as good an instance of reason as any we have given. The Dog evidently argued to himself in this wise :—"If I fly upon this wretched Cat and deprive her of her stolen goods by force, she will get nothing more than a fright, or, perhaps, a few tooth marks; but if I lodge a complaint against her before the proper tribunal, her guilt will be manifest to the whole household, and she will be got rid of, or even killed." The Dog, by the way he conceived and acted on this plan, showed himself to be nearly as clever and almost as wicked as a great many men one reads about in history.

We have spoken of maternal love as exhibited by the Dog. This is, of course, a case of instinct; but instances are not wanting in which Dogs have shown the high faculty of devoted love towards other than their offspring, and of friendship like that of Ruth for Naomi. Mr. Darwin mentions a Greyhound bitch who, contrary to the usual custom of her race, fell deeply in love with a Pointer, and would have nothing to say to any other Dog during the life of her lover; and, stranger still, when he died, she showed a constancy equal to that of the best of her sex among the human race, and remained strictly faithful to his memory, never afterwards bearing pups.

Rarer than conjugal affection amongst animals, is friendship between individuals of the same sex; of this, too, instances are not wanting. Mr. Youatt relates the following :—"Two Dogs, the property of a gentleman at Shrewsbury, had been companions for many years, until one of them died of old age. The survivor immediately began to manifest an extraordinary degree of restless anxiety, searching for his old associate in all his former haunts, and refusing every kind of food. He gradually wasted away, and at the expiration of the tenth day he died, the victim of an attachment that would have done honour to man."

Of equally intense devotion to man, instances are so numerous that one hardly knows which to mention. None is, perhaps, more wonderful or more affecting than that we have already mentioned, of the Dog who watched for three months by the corpse of his dead master on Helvellyn. There is also a tale of a Newfoundland Dog, whose master—a soldier—returned to his home, after an absence of many years, when the Dog recognised him at once, "leaped upon his neck, licked his face, and died." He must have retained, during the whole of the time his master was away, the memory of his care and friendship. One cannot doubt that he often thought of and longed for him; and the rush of joy and hope fulfilled was too much for the great heart of the noble animal. He succumbed to the intensity of his feelings, thereby showing himself to be superior in one of the highest and grandest of qualities to by far the greater proportion of the human race. How many men, or even women, of one's own acquaintance, are *capable* of dying of joy?

But there is a dark side to this picture. A very large proportion of Dogs possess but little of this virtue of fidelity, but have greatly developed the contrary vice of extreme fickleness. They will change masters without the slightest objection, and be "off with the old love and on with the new" absolutely without a pang. Froissart, the chronicler, tells a curious tale respecting the treachery of Richard II.'s Dog, "a Grayhounde, called Mithe, who always wayted upon the kynge, and woulde knowe no man els. For where so ever the kynge did ryde, he that kept the Grayhounde dyd lette him lose, and he wolde streyght runne to the kynge, and faune uppon hym, and leape with his fore fete uppon the kynge's shoulders. And as the kynge and the Erle of Derby (Bolingbroke, afterwards Henry IV.) talked togyder in the courte, the Grayhounde, who was wonte to leape uppon the kynge, left the kynge, and came to the Erle of Derby, Duke of Lancastre, and made to him the same friendly continuance and chere as he was wonte to do to the kynge. The duke, who knewe not the Grayhounde, demanded of the kynge what the Grayhounde would do? 'Cousin,' quod the kynge, 'it is a greate goode token to you, and an evyl signe to me.' 'How knowe you that?' quod the duke. 'I knowe it well,' quod the kynge. 'The Grayhounde acknowledgeth you here this day as Kynge of England, as ye shall be, and I shall be deposed; the Grayhounde hath this knowledge naturally; therefore take hym to you: he wyll follow you and forsake me.' The duke understood well these words, and cherished the Grayhounde, who wolde never after follow Kynge Richard, but followed the Duke of Lancastre." This anecdote, curious, if true, would seem to show that rats and men are not the only animals who make haste to leave a sinking ship.

POMERANIAN DOG.

We have made mention of a certain quarrelsome Dog, fond of picking a quarrel, who always took care, with the true instinct of a cowardly bully, to pick out old or infirm persons as objects of his attacks. We are glad to say that we have found a notice of a Setter who showed a becoming respect for age. His owner says:—

"One other curious fact may here be mentioned about this Dog. Although naturally a very vivacious animal, and, when out for a walk with myself or any other young person, perpetually ranging about in search of game, yet, if taken out for a walk by an elderly person, he keeps close to heel all the time, pacing along with a slow step and sedate manner, as different as possible from that which is natural to him. This curious behaviour is quite spontaneous on his part, and appears to arise from the sense of the respect that is due to age."

We need hardly say that this Dog belongs to Mr. Romanes, amongst whose animals specimens of all the Christian gifts and graces seem to be found.

We thus see that a very large proportion of our own virtues and vices are developed in our canine "fellow-mortals"; there is, however, one state of mind which we should hardly expect to find in any animal, viz., despair. With man it is, alas! sufficiently common to feel that he has had enough of "life's fitful fever," and that the only thing left is to make haste

> "—— to be hurled
> Anywhere, anywhere, out of the world."

But who would expect a dumb quadruped to have feelings of this sort? Yet that such may be the case is rendered probable by the following remarkable story:—

"A day or two since, a fine Dog, belonging to Mr. George Hone, of Frindsbury, near Rochester, committed a deliberate act of suicide by drowning in the Medway at Upnor, Chatham. The Dog had been suspected of having given indications of approaching hydrophobia, and was accordingly shunned, and kept as much as possible from the house. This treatment appeared to cause him much annoyance, and for some days he was observed to be moody and morose. On Thursday morning he proceeded to an intimate acquaintance of his master's at Upnor, on reaching the residence of whom he set up a piteous cry on finding that he could not obtain admittance. After waiting at the house some little time, he was seen to go towards the river close by, when he deliberately walked down the bank, and, after turning round and giving a kind of farewell howl, walked into the stream, where he kept his head under water, and in a minute or two rolled over dead. This extraordinary act of suicide was witnessed by several persons. The manner of his death proved pretty clearly that the animal was not suffering from hydrophobia." *

The last statement of the writer of this anecdote may be called in question, as it is a well established fact that a mad Dog will often plunge its head into water, and make violent though ineffectual efforts to drink; and it is very likely that the Dog in question had no real intention of committing suicide, but was drowned while attempting to slake his insatiable thirst. This seems a probable explanation, though it takes the point from our tale.

Of that most horrible and fatal disease—rabies—little need be said here. It is accompanied in the Dog by inflammation, inability to swallow, insensibility to pain, even to severe blows or burns, and usually great ferocity, and a disposition to bite everything that comes in its way. The gait, the glance, and also the howl of a mad Dog are very characteristic. But the most terrible thing about rabies is that it can be communicated to man, producing in him the special human form of the disease, hydrophobia. This latter, like rabies, never arises except by inoculation with the saliva of a rabid Dog, so that both these terrible, and it is to be feared increasing diseases, might be stamped out by the adoption for a few months of a rigorous quarantine.† When a human being is bitten, symptoms of rabies usually occur in from a fortnight to three months; but a case is on record in which the disease did not appear for twelve years! When the poison is once established in the system a cure seems to be utterly impossible. The only remedy is at once either to cut out the wound or to rub it deeply and thoroughly with lunar caustic (nitrate of silver), which Mr. Youatt states to be far more efficacious than actual cauterising or burning with a red-hot iron.

The varieties or breeds of the Dog are extremely numerous, and differ from each other to a wonderful degree. In the matter of size, we have the Mastiff, as large as a pony, at one end of the series, and the Toy-terrier, a few inches long, at the other. As to the development of hair, there is every gradation, from the hairless Turkish Dog to the Skye-terrier or the Poodle; as to running powers, there are the Greyhound and the Turnspit; in the matter of mental and moral characteristics, we have the intelligent Shepherd's Dog, the obstinate and courageous Bull-dog, the silly Italian Greyhound, and the lazy Lap-dog. Never was animal so thoroughly, so unanimously, and so successfully selected: never did any show such endless variation in so many particulars.

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* Quoted from the *Daily News* in the article on "Animal Depravity" in the *Quarterly Journal of Science* for 1875.

† See Sir Thomas Watson: "Hydrophobia and Rabies," *Nineteenth Century*, December, 1877.

CHAPTER VIII.

THE DOG FAMILY.—DOGS OF SAVAGES—DOGS OF CIVILISED NATIONS—WILD DOGS.

THE HARE INDIAN DOG—Its Characters, Disposition, &c.—THE ESKIMO DOG—The Dependence of the Greenlanders on its Existence—The Probability of its Speedy Extinction—Its Characters and Savage Disposition—Its Uses—DOMESTIC DOGS OF OTHER SAVAGE TRIBES—African Breeds—South American Breeds—THE DALMATIAN DOG—THE GREYHOUND—THE SCOTCH GREYHOUND—THE DEERHOUND—THE TURKISH GREYHOUND—THE GRECIAN GREYHOUND—THE PERSIAN GREYHOUND—THE ITALIAN GREYHOUND—THE COCKER—THE SPRINGER—THE KING CHARLES'S SPANIEL—THE BLENHEIM SPANIEL—THE CHINESE PUG-DOG—THE WATER-SPANIEL—THE POODLE—THE MALTESE DOG—THE LION-DOG—THE TURKISH DOG—THE ST. BERNARD DOG—THE NEWFOUNDLAND DOG—THE SHEEP-DOG—THE POMERANIAN DOG—THE CUR—THE LURCHER—THE BEAGLE—THE HARRIER—THE FOXHOUND—THE STAGHOUND—THE BLOODHOUND—THE SETTER—THE POINTER—THE RETRIEVER—THE OTTER-HOUND—THE TURNSPIT—THE DACHSHOUND—THE BULL-DOG—THE BULL-TERRIER—THE MASTIFF—THE CUBAN MASTIFF—THE TIBET DOG—THE ENGLISH TERRIER—THE SCOTCH TERRIER—PARIAH DOGS—THE INDIAN WILD DOG—THE DINGO.

NOT only has civilised man his endless breeds of Dogs, but nearly every savage tribe of any degree of intelligence has, to a greater or less degree, succeeded in producing a race exhibiting well-marked characters, useful to them as a guardian of flocks or a beast of burden. Then, in many parts of the world there are to be found troops of Dogs which have become wild, though not sufficiently so to be actually dangerous, and which act as scavengers in those countries which, like Turkey, are not blessed with a particularly stringent code of sanitary regulations. We shall first consider the Dogs kept by savages.

THE HARE INDIAN DOG.

This interesting variety (see figure on p. 104) is found only in North America, in the region of the Great Bear Lake and the Mackenzie River, where it is kept as a Hunting-dog by the Hare Indians and one or two other tribes. As we mentioned above, it deserves great interest from the fact that it closely resembles the Prairie-wolf, from which it is very probably descended.

"The Hare Indian Dog has a mild countenance, with, at times, an expression of demureness. It has a small head, slender muzzle, erect thickish ears, somewhat oblique eyes, rather slender legs, and a broad, hairy foot, with a bushy tail, which it usually carries curled over its right hip. It is covered with long hair, particularly about the shoulders; and at the roots of the hair, both on the body and tail, there is a thick wool. The hair on the top of the head is long, and on the posterior part of the cheek it is not only long, but being also directed backwards, it gives the animal, when the fur is in prime order, the appearance of having a ruff round the neck. Its face, muzzle, belly, and legs are of a pure white colour, and there is a white central line passing over the crown of the head and the occiput. The anterior surface of the ear is white, the posterior yellowish-grey, or fawn-colour. The end of the nose, the eyelashes, the roof of the mouth, and part of the gums, are black. There is a dark patch over the eye. On the back and sides there are larger patches of dark blackish-grey, or lead-colour, mixed with fawn-colour and white, not definite in form, but running into each other. The tail is bushy, white beneath and at the tip. The feet are covered with hairs, which almost conceal the claws. Some long hairs between the toes project over the soles; but there are naked callous protuberances at the root of the toes and on the soles, even in the winter time, as in all the Wolves described in the preceding pages. The American Foxes, on the contrary, have the whole of their soles densely covered with hair in the winter. Its ears are proportionably nearer each other than those of the Eskimo Dog.

"The Hare Indian Dog is very playful, has an affectionate disposition, and is soon gained by kindness. It is not, however, very docile, and dislikes confinement of every kind. It is very fond of being caressed, rubs its back against the hand like a Cat, and soon makes an acquaintance with a stranger. Like a wild animal, it is very mindful of an injury, nor does it, like a Spaniel, crouch under the lash; but if it is conscious of having deserved punishment, it will hover round the tent of its master the whole day, without coming within his reach even when he calls it. Its howl, when hurt or afraid, is that of the Wolf; but when it sees any unusual object, it makes a singular attempt at barking, commencing by a kind of growl, which is not, however, unpleasant, and ending in a prolonged howl. Its voice is very much like that of the Prairie-wolf. The larger Dogs, which we had for draught at Fort Franklin, and which were of the mongrel breed in common use at the fur-posts, used to pursue the Hare Indian Dogs for the purpose of devouring them; but the latter far outstripped them in speed, and easily made their escape. A young puppy, which I purchased from the Hare Indians, became greatly attached to me, and when about seven months old ran on the snow by the side of my sledge for nine hundred miles without suffering from fatigue. During this march, it frequently, of its own accord, carried a small twig, or one of my mittens, for a mile or two; but, although very gentle in its manners, it showed little aptitude in learning any of the arts which the Newfoundland Dogs so speedily acquire, of fetching and carrying when ordered. This Dog was killed and eaten by an Indian on the Saskatchewan, who pretended that he mistook it for a Fox." *

THE ESKIMO DOG.

The importance of this half-tamed variety (see figure on p. 105) to the cold stunted beings who keep it can hardly be over-estimated. An undoubted authority, Dr. Robert Brown, F.L.S., observes:—

"When the Greenland Dogs die off, the Greenlander must become extinct: more certainly even than must the 'Plain' Indian when the last Buffalo is shot. It is impossible for him to drag home the Seals, Sharks, White Whales, or Narwhals which he may have shot in the winter at the 'strom-holes' in the ice without his Dogs; or for the wild native in the far North to make his long migrations, with his family and household goods, from one hunting-ground to another without these domestic animals of his. Yet that sad event seems to be not far distant. Several years ago, a curious disease, the nature of which has puzzled veterinarians, appeared among the Arctic Dogs, from high up in Smith's Sound down the whole coast of Greenland to Jakobshavn (69° 13′ N. lat.), where the ice-fjord stops it from going farther south; and the Government uses every endeavour to stop its spread beyond that barrier by preventing the native Dogs north and south from commingling. Kane and Hayes lost most of their Dogs through this disease; and at every settlement in Danish Greenland the natives are impoverished through the death of their teams. It is noticed that whenever a native loses his Dogs he goes very rapidly down-hill in the sliding scale of Arctic respectability, becoming a sort of hanger-on of the fortunate possessor of a sledge-team.

"During the latter portion of our stay in Jakobshavn, scarcely a day elapsed during which some of the Dogs were not ordered to be killed, on account of their having caught this fatal epidemic.

"The Dog is seized with madness, bites at all other Dogs, and even at human beings. It is soon unable to swallow its food, and constipation ensues. It howls loudly during the continuance of the disease, but generally dies in the course of a day, with its teeth firmly transfixing its tongue. It has thus something of the nature of hydrophobia, but differs from that disease in not being communicable by bite, though otherwise contagious among Dogs. The Government sent out a veterinary surgeon to investigate the nature of the distemper; but he failed to suggest any remedy, and it is now being 'stamped out' by killing the Dogs whenever seized—a heroic mode of treatment, which will only be successful when the last Dog becomes extinct in Greenland."

The Eskimo Dog is found throughout a great part of the Arctic regions—the herds found in Siberia, Kamtschatka, and Arctic America being all closely allied to one another, and all resembling, to a wonderful degree, the great Arctic Wolf, from which there can be little doubt they are descended. In form they resemble the Shepherd's Dog, and attain to the size of the Newfoundland. The muzzle and ears are pointed, the hair long, and with a short yellowish-grey fur between the hairs. The eyes are often oblique, and the howl peculiarly wolfish. The colour varies a good deal: some of the Dogs being black, with a white breast; others white; others reddish, yellowish, or spotted. This variety in colour is very characteristic of domesticated races of animals. There is never the same amount of difference found between the individuals of a wild species.

Not only does the Eskimo Dog agree with the Wolf in appearance, but also in disposition: it is wild, savage, and obstinate to a degree almost inconceivable to us, who are only acquainted with civilised Dogs. In illustration of the wolf-like disposition of the beast, Dr. Robert Brown relates an incident which shows that it is but little removed from its probable ancestor. We said above that it was only half-tamed; so certainly is this the case, that it "can only be kept in subjection by the most unmerciful lashing, for its savage nature will out. When at Clyde River, in 1861, I heard of a most

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* Sir J. Richardson's "*Fauna Boreali-Americana.*"

horrible tragedy which had been enacted there a few years before. A man, a boy, and a little girl landed there from an *omiak* (or open skin-boat), on an island where, as is usual, some Dogs were confined. Before the poor people could escape to their boat, the animals, infuriated by hunger, sprang upon them. The man and the boy, though much lacerated, managed to regain the *omiak*, but the poor girl was torn to pieces."

Wolves could hardly be much worse than this. These Dogs were, however, confined and half-starved; but another writer * relates how he very nearly fell a victim to a pack of Dogs in actual use, at the door of his own hut.

"Leaving the hunters to look after their teams, I returned to the hut. The blinding snow, which battered my face, made me insensible to everything except the idea of getting out of it; and, thinking of no danger, I was in the act of stooping to enter the doorway, when a sudden noise behind me caused me to look around, and there, close at my heels, was the whole pack of thirteen hungry Dogs, snarling, snapping, and showing their sharp teeth like a drove of ravenous Wolves. It was fortunate that I had not got down upon my knees, or they would have been upon my back. In fact, so impetuous was their attack, that one of them had already sprung when I faced round. I caught him on my arm, and kicked him down the hill. The others were for the moment intimidated by the suddenness of my movement, and at seeing the summary manner in which their leader had been dealt with; and they were in the act of sneaking away, when they perceived I was powerless to do them any harm, having nothing in my hand. Again they assumed the offensive; they were all around me; an instant more and I should be torn to pieces. I had faced death in several shapes before, but never had I felt as then; my blood fairly curdled in my veins. Death down the red throats of a pack of wolfish Dogs had something about it peculiarly unpleasant. Conscious of my weakness, they were preparing for a spring; I had not even time to halloo for help—to run would be the readiest means of bringing the wretches upon me. My eye swept round the group, and caught sight of something lying half-buried in the snow about ten feet distant. Quick as a flash I sprang, as I never sprang before or since, over the back of a huge fellow who stood before me, and the next instant I was whirling about me the lash of a long whip, cutting to right and left. The Dogs retreated before my blows and the fury of my onset, and then suddenly skulked behind the rocks. The whip had clearly saved my life; there was nothing else within my reach, and it had been dropped there quite accidentally by Katutunah as he went down to the sledges."

The horrible savagery of these poor wretches can hardly be wondered at; they live in a country where there is hardly a chance for them in any independent foraging expedition; they are half-starved by their masters, being fed chiefly on frozen walrus hides in the winter, and allowed to shift for themselves in the summer when their services are not required, and are in so perennial and acute a state of hunger that they are ready at any time to eat their own harness if allowed to do so.

It is generally stated that they are perfectly insensible to kindness, and only to be kept in order by a liberal application of the lash, or even of a more formidable weapon; for the Eskimo, if their Dogs are refractory, do not scruple to beat them about the head with a hammer, or anything else of sufficient hardness which happens to be at hand. They will even beat the poor brutes in this horrible manner until they are actually stunned. Notwithstanding the absolute dependence of the Eskimo on their Dogs, little or no care is taken of them; they receive nothing in any degree approaching petting, and spend all their time in the open air.

The chief use of the Eskimo Dog is to draw the sledges, which are the only possible conveyance in that frozen land. In all the Arctic expeditions which have been sent out at various times, a good supply of Sledge-dogs has been one of the greatest *desiderata*, as without them it would be absolutely impossible to proceed far. No other animal would answer the purpose, both horses and cattle being quite useless in journeys over ice and snow, amongst which the pack of light, active Dogs make their way with wonderful ease and safety.

The presence of a good leader to every sledge-team is of the first importance: the other Dogs obey him far more implicitly than the driver, as he has gained his proud position *vî et armis,* and keeps all his subordinates in the strictest order. Notwithstanding this, the behaviour of the team while running is far from exemplary. Captain Lyon says "they are constantly fighting, and I do not recollect to have seen one receive a flogging without instantly wreaking his passion on the ears of his neighbour." So that it is always best to trust to a good leader than to any amount of whipping, as the latter may only involve the whole concern—team, sledge, driver, and all—in hopeless and inextricable confusion. "Among the Eskimo on the western shores of Davis Straits, a loose Dog usually precedes the sledge, and, by carefully avoiding broken places in the ice, acts as a guide to the sledge-team, which carefully follows his lead."

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* Hayes, quoted by Jesse.

Besides their use as draught animals, these Dogs are employed in Bear and Seal hunting. Their skin is also valuable, and the natives are extremely fond of their flesh, although, as the Dog is getting gradually scarcer, they can seldom indulge in the dainty.

THE DOMESTIC DOGS OF OTHER SAVAGE TRIBES.

The Antarctic savages occasionally domesticate the Dingo. Of this Dog we shall give an account later on. Many of the African savages—such, for instance, as the Damaras, Namaquas, and Kaffirs—also keep Dogs. The first-named of these tribes take great care of the Dogs, and value them highly. Mr. Andersson says he has "known them pay as much as two fine Oxen for a Dog." The Kaffir Dogs, on the contrary, are thought very little of. Mr. Baldwin speaks of them as "a set of noisy curs, which invariably, at the sight of a white man, tumble head-over-heels in all directions, upsetting everything, as frightened as if they had seen an apparition. After the first alarm, they bait you unmercifully, and for many minutes it is impossible to hear yourself speak. I don't know that I ever succeeded in making friends with a real Kaffir cur in my life, not even a puppy; and I scarcely ever saw, or knew, or heard of one good for anything; they do, indeed, lead the life of a Dog. They are well fed when quite young, but afterwards they are expected to provide for themselves, and are consequently wretchedly lean and mangy, but they continue to exist."

Dogs are also half-tamed by the natives of South America, where there are, according to Humboldt, two very distinct breeds, one "totally hairless—with the exception of a small tuft of white hair on the forehead and at the tip of the tail—of a slate-grey colour, and without voice. This variety was found by Columbus in the Antilles, by Cortes in Mexico, and by Pizarro in Peru (where it suffers from the cold of the Cordilleras); and it is still very frequently met with in the warmer districts of Peru, under the name of *Peiros Chinos.*"

The second kind, sometimes called *Canis ingæ*, "belongs to the barking species, and has a pointed nose and pointed ears. It is now used for watching sheep and cattle. It exhibits many varieties of colour, induced by being crossed with European breeds. The *Canis ingæ* follows man up the heights of the Cordilleras. In the old Peruvian graves, the skeleton of this Dog is sometimes found resting at the feet of the human mummy, presenting an emblem of fidelity frequently employed by the mediæval sculptors."

This breed is also distinguished by great ferocity, and will bite strangers upon the slightest provocation, or even without any provocation at all. With their masters, too, they are often very surly.

We now come to

THE DOGS OF CIVILISED NATIONS,

and we commence with the Greyhound and its near allies—Dogs of swift flight, poor sense of smell, and of a comparatively low order of intelligence, the brain-case being proportionally smaller than in any other breed.

THE DALMATIAN DOG.

This is a comparatively unimportant breed; it is employed in England solely for the purpose of attending on carriages, from which circumstance it is often called the Carriage-dog. It is about the size of a Greyhound, usually of a white colour spotted with black, and its hair is quite short. The Danish Dog is a large sub-variety of the same breed.

THE GREYHOUND.

The various breeds of this Dog (see figure on p. 117) are the most elegant in the whole species. The expression "a line of beauty is perpetual motion," hackneyed though it be, occurs to every one in thinking of a Greyhound, the shape and movements of which are so perfectly graceful. The general characters of the variety are well known, and are well and pithily given in an old rhyme, quoted by Mr. Youatt, according to which

> "A Greyhounde should be headed lyke a Snake,
> And neckyd lyke a Drake,
> Fotyd like a Cat,
> Tayled like a Ratte,
> Syded like a Teme,
> And chyned like a Bream."

The head is proportionally smaller than in any other variety, and, in consequence of this, the Greyhound is by no means one of the Dogs particularly noted for intellect, his energy having all gone off in the direction of speed, and there being, in consequence, none to spare for brain-power. He is, in fact, an athlete, and nothing more—a pace *et præterea nihil.* In former times the Greyhound was sufficiently strong to cope with the Wolf, but for many hundred years he has gradually degenerated in strength, and towards the close of the last century was so deficient in courage and perseverance that Lord Oxford, one of the lights of the sporting world at that time, hit upon the ingenious plan of crossing his Greyhounds with Bull-dogs. This expedient was so successful that, "after the sixth or seventh generation, there was not a vestige left of the form of the Bull-dog; but his courage and his indomitable perseverance remained, and, having once started after his game, he did not relinquish chase until he fell exhausted, or perhaps died. This cross is now almost universally adopted. It is one of the secrets in the breeding of the Greyhound."

The form of the Greyhound is as well known as that of any Dog: its long, slender muzzle, capacious chest, slender loins, and beautifully-shaped limbs, are familiar to every one; the latter form a set of spring-levers only equalled by the limbs of a Racehorse or a Deer. The colour is very variable—black, white, fawn, or brindled. The hair is short and fine, and the ears rise erect for a certain height and then hang over.

This Dog is now used only for coursing or hare-hunting. In performing this task, it is guided entirely by the eye, its sense of smell being deficient, and practically of no importance in the chase: so that if once the Greyhound loses sight of the game, the latter is started again by a Spaniel. The speed attained by a good Greyhound is very remarkable: it is, indeed, only just inferior to that of a Racehorse.

THE SCOTCH GREYHOUND.

This is a more strongly-built variety or sub-breed of the Common or English Greyhound. It is less swift than its southern brother, but more muscular, more hairy, and inclined to "dodge" the Hare in coursing, instead of winning by speed alone.

THE DEERHOUND.

This is a well-marked variety of the Greyhound breed, distinguished by stronger form, shaggy hair, and drooping ears. Both in appearance and in disposition it is wilder and more savage than the Greyhound; sometimes being decidedly inclined to ferocity. It was a Dog of this breed, named "Maida," which was the special favourite of Sir Walter Scott, and which is so often painted by the side of the great novelist, who describes his noble hound, under the name of "Bevis," in "Woodstock," as being "in strength a Mastiff, in form and almost in fleetness a Greyhound. Bevis was the noblest of the kind which ever pulled down a Stag, tawny-coloured like a Lion, with a black muzzle and black feet, just edged with a line of white round the toes. He was as tractable as he was strong and bold."

THE TURKISH GREYHOUND,

if Greyhound it should be called, is a small Dog, either entirely devoid of hair, or having only a few hairs on its tail. "He is never now in the field, and bred only as a spoiled pet—and yet not always spoiled, for anecdotes are related of his inviolable attachment to his owner. One of them belonged to a Turkish Pacha, who was destroyed by the bowstring. He would not forsake the corpse, but laid himself down by the body of his murdered master, and presently expired."*

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* Youatt.

THE GRECIAN GREYHOUND

is doubtless the lineal descendant of the one sculptured on Grecian temples. It is a decidedly less specialised Dog than the English breed, its head being larger, its snout shorter, and its fur longer, especially on the tail.

THE PERSIAN GREYHOUND.

This Dog is slenderer, and has more hairy ears than the English breed. It is "much prized by the Bedouin Sheikhs, and used for the chase of the Gazelle. With its elegant shape, and the long silky hairs of its ears and tail, it is, perhaps, the most beautiful race of its kind."*

THE ITALIAN GREYHOUND

is the smallest variety of the breed, and is used almost exclusively as a pet, for which it is valuable on account of its exquisitely beautiful form and its general amiability (see figure on p. 116); but, like many amiable people, it is a thoroughly silly little beast, devoid of all higher canine intelligence, and almost incapable of forming a strong attachment.

In all the Dogs we have yet considered, the brain-case is small, and, in consequence, the intelligence is not of a very high order. In those of which we must now treat, the brain-case, with its contained organ, is of considerable size, giving the Dog the appearance of possessing a large forehead. They all, too, have great power of scent. There are, first of all, a number of Dogs consecutively grouped together under the general term of "Spaniels."

THE COCKER,

like other Spaniels, has long hair, very long pendent ears, and an elevated tail. It is one of the smallest of its kind, and is chiefly used for flushing Woodcocks and Pheasants in thickets and copses, into which the Setter, and even the Springer, can scarcely enter.

THE SPRINGER

is used for the same purpose as the Cocker, but is a larger, stronger, and steadier Dog.

THE KING CHARLES'S SPANIEL

has all the Spaniel characteristics in an exaggerated form. Its forehead is round and prominent, its coat is long and fine, the silky hair of its pendulous ears sweeps the ground, and its eye is large and moist. It is very small, and is consequently known almost entirely as a drawing-room pet. The King Charles of the present day is an interesting example of deterioration; for, as Mr. Youatt says, "it is materially altered for the worse." The muzzle is almost as short, and the forehead as ugly and prominent, as in the veriest Bull-dog. The eye is increased to double its former size, and has an expression of stupidity, with which the character of the Dog too accurately corresponds. Still, there is the long ear, and the silky coat, and the beautiful colour of the hair, for which characters the breed is still much prized. The Spaniels which were the special pets of the heartless voluptuary after whom they are named were of the black-and-tan kind. Charles I. preferred a black breed.

THE BLENHEIM SPANIEL

is very similar to the King Charles; and, like it, is almost exclusively a drawing-room pet.

THE CHINESE PUG-DOG

is an interesting variety, which has been produced by those indefatigable people, who love anything queer, and seem to think nothing perfect until it is deformed. Dr. John Edward Grey says of this Dog:—

"It is a small, long-haired Spaniel, with slender legs, and rather bushy tail curled over its back. It differs from the Pug-nosed Spaniel, called King Charles's Spaniel, in the hair being much longer and more bushy, the tail closely curled up, and the legs being smaller and much more slender. The nose of the Chinese or Japanese Pug is said by some to be artificially produced by force, suddenly

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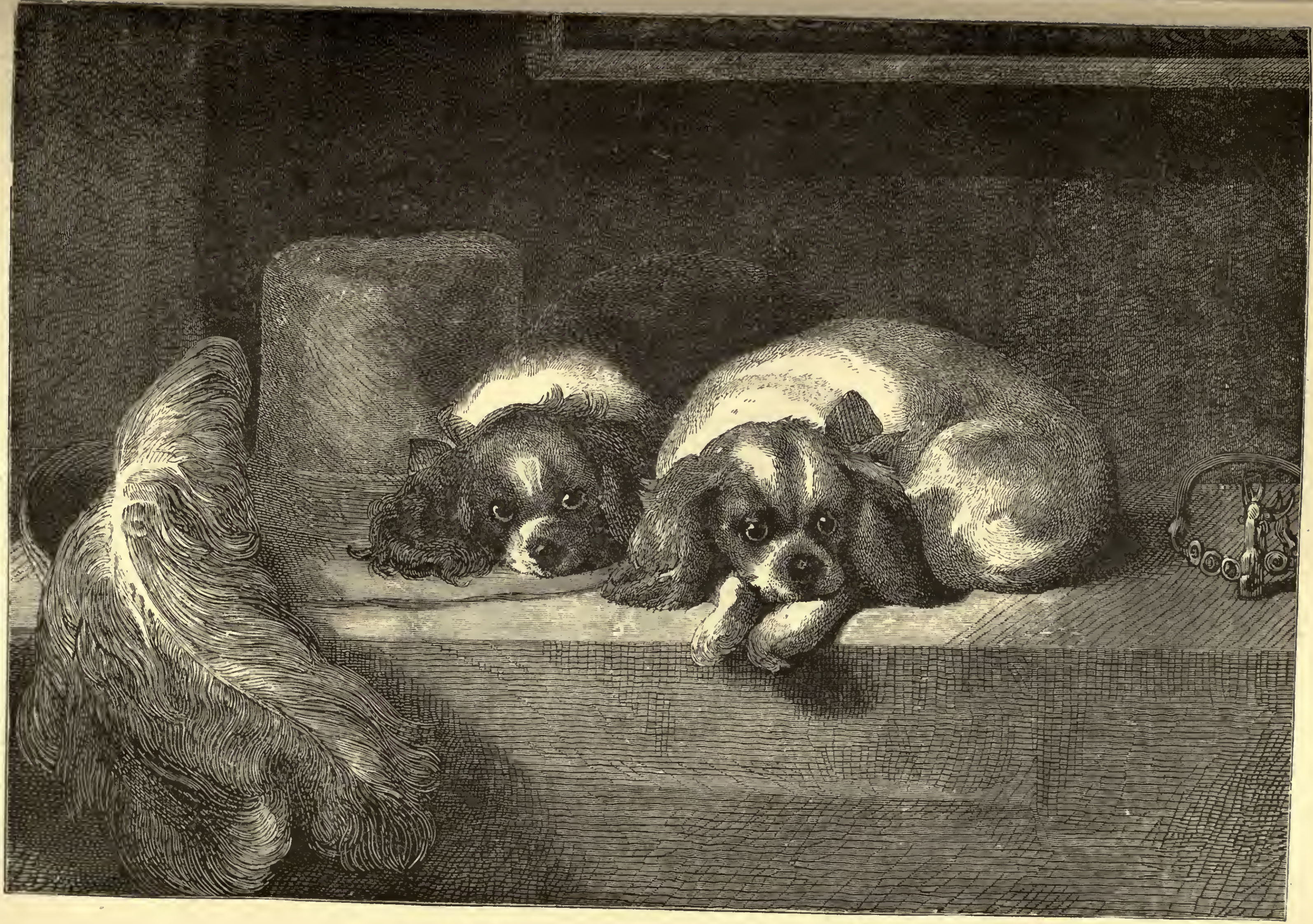
* Tristram.



KING CHARLES'S SPANIELS. *(After Sir Edwin Landseer.)*

or continuously applied; but that is certainly not the case in the skull that is in the British Museum, for the bones of the upper jaw and the nose are quite regular and similar on the two sides, showing no forced distortion of any kind such as is to be observed in the skulls of some Bull-dogs; for I believe that some 'fanciers' are not satisfied with the peculiarity, and do sometimes try to increase the deformity by force."

Dr. Lockhart states that "there are two kinds of Pug in China: one, a small black-and-white, long-legged, pug-nosed, prominent-eyed Dog; the other, long-backed, short-legged, long-haired, tawny-coloured, with pug-nose and prominent eyes. Sometimes in these Dogs the eyes are so prominent that I have known a Dog have one of his eyes snapped off by another Dog in play. The preference for vegetable food is a fact, but I think it is a result of education, as most of them will take animal food; this is usually kept from them, so that their growth and organisation may be kept down. The Sleeve Dog is a degenerated, long-legged variety of Pug, rigidly kept on low diet, and never allowed to run about on the ground. They are kept very much on the top of a kang, or stove bed-place, and not allowed to run about on the ground, as it is supposed that if they run on the ground they will derive strength from the ground, and be able to grow large. Their food is much restricted, and consists chiefly of boiled rice."

POODLES. *(One-eighth Natural Size.)*

THE WATER-SPANIEL

is larger than any of the Spaniels already mentioned: it is also a stronger Dog, and has closely-curled hair, and ears proportionally much shorter than in the preceding breeds. It is used in shooting, having first to find the game, and then, when a bird falls, to bring it to its master without mangling. It is one of the most docile and intelligent of Dogs, and has numerous tales told of it, both in prose and poetry. Among the latter we may mention Cowper's well-known piece "The Water Lily."

THE POODLE

is a Dog of Continental origin, and is well known by its thick, generally white, curly hair, which conceals its face and covers its body like a mat. In France, and sometimes, alas! in England, people try to improve the breed by shaving off the hair from the hinder half of the body, with the exception of the tip of the tail, thus making the wretched animal a spectacle to men and angels. Some misguided people go even further than this, and dye the hair of various colours—making, perhaps, a magenta body and a yellow tail, or some other equally tasteful and appropriate combination.

The Poodle, notwithstanding the way it is treated, is an extremely intelligent Dog, and capable of learning all sorts of tricks; it will walk on its hind legs, dance, sham dead, and, in fact, do almost anything it is taught. It is also affectionate and devoted, and has shown itself capable of retaining for life the memory of a deceased master.

A small variety of the Poodle is the *Barbet*, which, according to Mr. Youatt, is unmanageable except by its owner, ill-tempered, "eaten up with red mange, and frequently a nuisance to its master and a torment to every one else." Notwithstanding this, it is an extremely intelligent Dog; and, indeed, "the Barbet possesses more sagacity than most other Dogs, but it is sagacity of a particular kind, and frequently connected with various amusing tricks. Mr. Jesse, in his 'Gleanings in Natural History,' gives a singular illustration of this. A friend of his had a Barbet that was not always under proper command. That he might keep him in better order, he purchased a small whip, with which he corrected him once or twice during a walk. On his return the whip was put on a table in the hall, but on the next morning it was missing. It was soon afterwards found concealed in an out-building, and again made use of in correcting the Dog. Once more it would have been lost, but, on watching the Dog, who was suspected of having stolen it, he was seen to take it from the hall-table in order to hide it once more." *

THE MALTESE DOG

is an animal of the Poodle kind, of very considerable antiquity, as it is mentioned by Strabo as *Canis melitæus.* It has a long body, short legs, pendent ears, and long silky hair, of a pure white, or sometimes yellowish colour. One of the chief points about this Dog is its extremely small size.

THE LION DOG

is possibly, according to Mr. Youatt, a cross between the Maltese and the hairless Turkish Dog. Its name is derived from the fact that its hair, long on the head, neck, and fore-legs, is extremely short over the rest of the body, except at the end of the tail, where there is a small tuft.

THE TURKISH DOG

is occasionally seen in England, but is, properly speaking, a native of hot climates. Its usual name of Turkish or Egyptian Dog is, however, quite a misnomer. It is almost entirely naked, and, more curious still, subject to a disease of the teeth, which drop out so early that the Dogs often have nothing left to bite with but a single grinder on each side. This Dog is a curious and interesting instance of degeneration, for its two distinguishing characters—hairlessness and toothlessness—are actual deformities.

THE ST. BERNARD DOG.

This magnificent breed is now better known than formerly in England, as it is becoming quite usual to keep them instead of Mastiffs or Newfoundlands. The readers of *Punch* have been familiarised with its form, from Mr. Du Maurier's sketches, who has been as successful in depicting the noble Dog as the delightful little girl who, wishing to enter a bazaar where Dogs are not admitted, proposes to her sister to hide the gigantic creature under their skirts!

The breed was, until lately, almost confined to the Alps, where it was kept by the monks of the convent of Mount St. Bernard, and sent out, provided with a little barrel of brandy tied round its neck, to rescue travellers lost in the snow. The number of people who have been saved from death in this way, by the humanity of these good monks and the intelligence of their Dogs, must be very great, for a single Dog, the celebrated "Barry," saved no less than forty lives himself, and at last perished on one of his expeditions of mercy.

* Youatt.

THE NEWFOUNDLAND DOG

is, according to Youatt, simply a large Spaniel: it is the finest and largest of Water-dogs (see figure on p. 121), besides being amongst the most intelligent and courageous. It is covered with thick curly hair, usually black or black-and-white, the curls being more flowing and not so close and woolly as in the ordinary Spaniel or the Retriever. So fully is this Dog adapted for swimming, that its feet have very considerable webs, extending between the toes—an evident adaptation to its aquatic habits.

Of the use and intelligence of this Dog it is needless to give instances. Again and again it has saved the lives of drowning people when human help was unavailable. We can give only one anecdote illustrative of the value of this Dog, whose kindness of heart is equal to his courage: who will guard and play with a little child or save a strong man from drowning with equal skill and readiness:—

FOXHOUNDS.

"A native of Germany was travelling one evening on foot through Holland, accompanied by a large Dog. Walking on a high bank, which formed one side of a dyke, his foot slipped, and he was precipitated into the water; and, being unable to swim, soon became senseless. When he recovered his recollection, he found himself in a cottage on the contrary side of the dyke, surrounded by peasants, who had been using the means for the recovery of drowned persons. The account given by one of them was that, returning home from his labour, he observed at a considerable distance a large Dog in the water, swimming and dragging, and sometimes pushing along, something that he seemed to have great difficulty in supporting, but which he at length succeeded in getting into a small creek on the opposite side. When the animal had pulled what he had hitherto supported as far out of the water as he was able, the peasant discovered that it was the body of a man, whose face and hands the Dog was industriously licking. The peasant hastened to a bridge across the dyke, and, having obtained assistance, the body was conveyed to a neighbouring house, where proper means soon restored the drowned man to life. Two very considerable bruises, with the marks of teeth, appeared, one on his shoulder, and the other on his poll; hence it was presumed that the faithful beast had first seized his master by the shoulder, and swum with him in this manner for some time, but that his sagacity had prompted him to quit his hold, and to shift it to the nape of the neck, by which he had been enabled

HEAD OF BLOODHOUND.

to support the head out of water; and in this way he had conveyed him nearly a quarter of a mile before he had brought him to the creek, where the banks were low and accessible."*

THE SHEEP DOG.

This is not only the most important of all our domestic breeds, but it is second to none for intelligence and devotion. It is quite a rare thing to find a Shepherd's Dog who will offer the slightest violence to the animals under its care; and it can often be trusted almost with the entire management of the flock, driving them from place to place, gathering them together to be counted, and making altogether a far more valuable assistant to the shepherd than any human being could possibly be. The Dog is wholly devoted to the work, and his obedience and skill are perfect, penning the Sheep from field after field, for his owner, who foots it slowly after him, and finds the flock ready to his hand. It used to be credibly reported to us in our boyhood, that some of these Dogs would lay themselves down by a Sheep that had got *cast* (*i.e.*, was weltering, back downwards, in the clayey furrow, and, loaded with wet and heavy wool, had lost power to rise); these Dogs, it was said, would push their arched spine against the helpless Sheep, and give them sufficient leverage to enable them to rise.

There are different kinds of Sheep Dogs found in different countries—there are, for instance, the English, the Scotch, and the French breeds. The Scotch Drover's Dog is also a well-marked sub-breed. The Scotch Shepherd's Dog, or Colley (see figure on p. 120), is now a good deal used as a pet: it is a very beautiful Dog, with a slender muzzle, small feet, long straight hair forming a sort of ruff round the neck; and, beneath this, a sort of under-coat of very soft fine hair. The origin of the Shepherd's Dog is, according to Mr. Youatt, "somewhat various; but the predominant breed is that of the intelligent and docile Spaniel."

THE POMERANIAN DOG

is a breed often seen in London streets. It is a beautiful Dog of medium size, with long, usually white, hair, straight ears, and a tufted tail. (See figure on p. 125.)

THE CUR

is a cross between the Sheep Dog and the Terrier.

THE LURCHER

was originally bred as a cross between the Sheep Dog and Greyhound, but was afterwards modified by a further cross with the Spaniel. It is used a good deal by poachers.

The next group of Dogs is conveniently known as *Hounds;* they are all used in the chase, and, being bred and selected especially for this work, are good for little else.

THE BEAGLE

is the smallest of the Hounds, usually not exceeding ten or twelve inches in height. These Dogs were formerly a good deal used in Hare-hunting, and were celebrated for their uniform size, close running, and musical voice. So small were they that they used to be carried to the field in panniers.

THE HARRIER

was also used for hunting the Hare. It is about half-way between the Beagle and the Greyhound as to size.

THE FOXHOUND

is, in England at least, the most important of the Hound group. He may, in fact, be looked upon as one of the main supporters of that peculiarly English institution, the Squirearchy; for what would become of the average country gentleman if he could not hunt through the winter six days a week, and visit his Hounds on Sunday?

The Foxhound (see figure on p. 136) "is the old English Hound, sufficiently crossed with the Greyhound to give him lightness and speed without impairing his scent." His height is about twenty-two to twenty-four inches; his fur short, ears long and drooping, and tail tolerably straight. He exhibits great variation as to hue; and an authority, cited by Youatt, "gives a curious account of the prejudices of sportsmen on the subject of colour. The white Dogs were curious hunters, and had a capital scent; the black, with some white spots, were obedient, good hunters, and with good constitutions; the grey-coloured had no very acute scent, but were obstinate and indefatigable in their quest; the yellow Dogs were impatient and obstinate, and taught with difficulty."

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* Youatt.

The statement about the particularly good scent of the white Hounds is very curious, for it is generally found that animals of light colour are inferior in sensory endowments to darker ones, owing to the absence of a peculiar black pigment from the delicate membranes to which the nerves of special sense are distributed.

The pace of the Foxhound is very rapid. One was known to run a course of four miles one furlong and one hundred and thirty-two yards in a trifle over eight minutes! Of the correctness of their scent, no one who has seen the Hounds put off and watched the unerring way they pursue the Fox, can have any doubt.

THE STAGHOUND.

This is the largest of modern English Hounds, and the one which most nearly approaches in character the old "Hound" which fell into disuse on account of its slowness, but which we often find mentioned in olden writers. Shakspere, for instance, writes of this old English or Southern Hound in "Midsummer Night's Dream":—

Hip. I was with Hercules and Cadmus once,
When in a wood of Crete they bay'd the bear
With hounds of Sparta: never did I hear
Such gallant chiding; for, besides the groves,
The skies, the fountains, every region near
Seem'd all one mutual cry: I never heard
So musical a discord, such sweet thunder.
The. My hounds are bred out of the Spartan kind,
So flew'd, so sanded; and their heads are hung
With ears that sweep away the morning dew;
Crook-knee'd and dew-lapp'd, like Thessalian bulls;
Slow in pursuit, but match'd in mouth like bells,
Each under each. A cry more tuneable
Was never holla'd to, nor cheer'd with horn,
In Crete, in Sparta, nor in Thessaly:
Judge when you hear.

Of the powers of scent possessed by the Staghound, the following is a notable example:—

"Lord Oxford reduced four Stags to so perfect a degree of submission, that, in his short excursions, he used to drive them in a phaeton made for the purpose. He was one day exercising his singular and beautiful steeds in the neighbourhood of Newmarket, when their ears were saluted with the unwelcome cry of a pack of Hounds, which, crossing the road in their rear, had caught the scent, and leaving their original object of pursuit, were now in rapid chase of the frightened Stags. In vain his grooms exerted themselves to the utmost; the terrified animals bounded away with the swiftness of lightning, and entered Newmarket at full speed. They made immediately for the Ram Inn, to which his lordship was in the habit of driving, and, having fortunately entered the yard without any accident, the stable-keepers huddled his lordship, the phaeton, and the Deer, into a large barn, just in time to save them from the Hounds, who came into the yard in full cry a few seconds afterwards."

THE BLOODHOUND.

This Dog resembles pretty closely the Deerhound, or old English Hound, but is considerably larger, with longer ears of a soft and delicate texture, and deeper "flews," or down-hanging upper lips. (See figure on p. 137.) The colour is brown, verging to reddish along the back, and to light fawn-colour below. The eyes should be surrounded with a distinct red ring, due to the exposure of the delicate membrane lining the eyelids. To judge from the animal's countenance, no one would imagine the horrid purpose for which it was originally bred, for few Dogs have a milder, more benevolent, or more intelligent visage.

In former times, these Dogs were used to track robbers and other offenders, a duty which they performed with the most unerring accuracy, never giving up the chase until they had brought their miserable quarry to bay. When engaged in this work, all their mildness disappeared, and they were transformed into perfect furies. Mr. Youatt, writing in 1845, says :—" The Thrapstone Association lately trained a Bloodhound for the detection of Sheep-stealers. In order to prove the utility of this Dog, a person whom he had not seen was ordered to run as far and as fast as his strength would

POINTERS.

permit. An hour afterwards, the Hound was brought out. He was placed on the spot whence the man had started. He almost immediately detected the scent, and broke away, and, after a chase of an hour and a half, found him concealed in a tree fifteen miles distant!"

THE SETTER,

according to Youatt, "is evidently the large Spaniel, improved to his peculiar size and beauty, and taught another way of marking his game, viz., by *setting* or crouching. If the form of the Dog were not sufficiently satisfactory on this point, we might have recourse to history for information on it. Mr. Daniel, in his 'Rural Sports,' has preserved a document, dated in the year 1685, in which a yeoman binds himself, for the sum of ten shillings, fully and effectually to teach a Spaniel to *sit* Partridges and Pheasants. The first person, however, who systematically broke-in sitting Dogs is supposed to have been Dudley, Duke of Northumberland, in 1335." The hinder surface of the legs, and the under surface of the tail of the Setter, should be well "feathered," that is, beset with long hair.

THE POINTER.

Mr. Darwin says:—"Our Pointers are certainly descended from a Spanish breed, as even the names Don, Ponto, Carlos, &c., would show. It is said that they were not known in England before the Revolution in 1688; but the breed, since its introduction, has been much modified," the change having been "chiefly effected by crosses with the Foxhound." The value of this Dog consists in his habit of "pointing," or standing silently, with lifted foot and outstretched muzzle, as soon as he finds game. A very remarkable circumstance with regard to this habit is the way in which it is inherited: a young Dog points instinctively the first time he is taken into the field.

More or less distinct sub-breeds of the Pointer are to be found in Spain, Portugal, France, and Russia. The hair is short, the colour variable.

THE RETRIEVER,

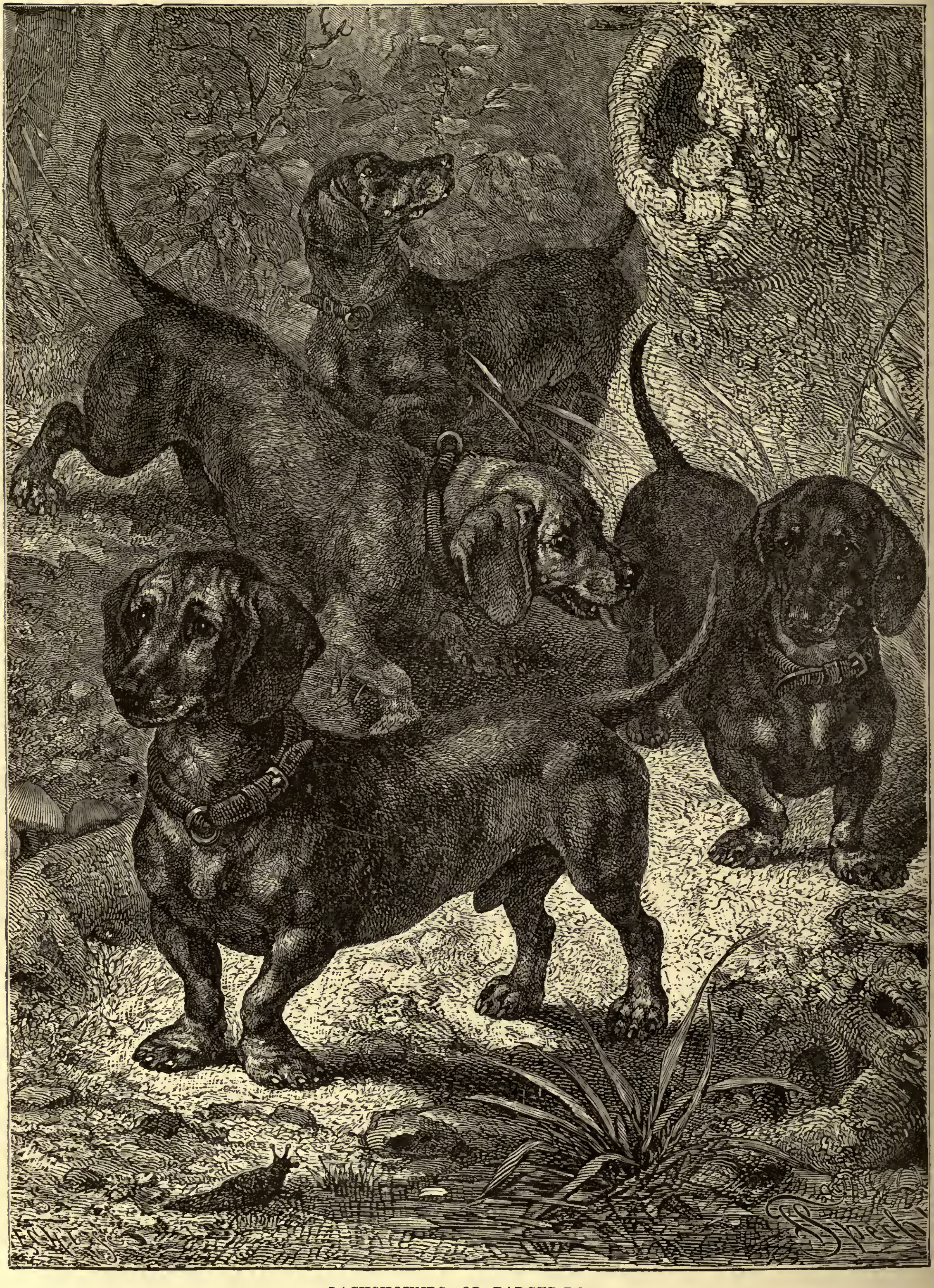
according to Brehm, is a cross between the Newfoundland and the Pointer. It is a good water-dog, and is used for sport, especially in shooting water-birds. It derives its name from its talent for *retrieving*, or following a wounded bird, and bringing it back to the sportsman without mangling. It is a large Dog, with a good forehead and long ears, and is covered with a closely-curled hide of a brown or black colour. (See figure on p. 113.)

THE OTTER-HOUND

is a breed formerly in great requisition for hunting the Otter, a sport which is now almost if not quite discontinued. This Dog "used to be of a mingled breed, between the Southern Hound and the rough Terrier, and in size between the Harrier and the Foxhound."

THE TURNSPIT.

Before the invention of bottle-jacks, this Dog was used in England to turn the spit on which the joint was roasted, for which purpose they were attached to a sort of wheel. It is a queer-looking Dog—very long-bodied and very short-legged, and is possessed of a great degree of intelligence. Brehm relates an anecdote of two Turnspits, who were employed in the kitchen of a house at Plessis, one of whom, the cook's favourite, had to turn the spit on Mondays and Wednesdays; the other taking his turn on Sundays, Tuesdays, and Thursdays. Friday and Saturday were holidays for both. One Wednesday the favourite Dog was absent, and the cook endeavoured to press into service the other rather than search for and disturb his pet. But No. 2, although he had made no objection to having three days of work to his mate's two, could not stand this: he growled and bit, and positively refused to be harnessed. At last he rushed out of the house, and made his way to an open place, where his lazy colleague was playing with some friends. As soon as he saw the truant, he hustled and bit at him, and finally drove him into the house to the cook's feet, having accomplished which act of justice he became calm, and looked quietly up to his master, as much as to say—"Here's your Dog: it's *his* turn now."



DACHSHOUNDS, OR BADGER-DOGS.

THE DACHSHOUND, OR BADGER-DOG,

is a German breed, closely allied to the Turnspit, but with the characters of the latter exaggerated. The fore-legs are crooked at the wrist-joint, and the feet are very large. It was originally bred, as its name implies, for Badger-hunting, and, so strong is its instinct for the sport even now it has become a drawing-room pet, that it will rush at anything that looks like a hole, and begin to burrow vigorously.

THE BULL-DOG

is undoubtedly the most savage and untamable of all the breeds: he is, moreover, except to the eyes of a fancier, the ugliest; for, although he has not the grotesque proportions of the Turnspit, yet his crooked legs, Rat's tail, flat forehead, little wicked eyes, turned-up nose, big mouth, and underhung lower jaw, make him a creature absolutely hideous to any one whose taste is not sufficiently cultivated to enable him to admire anything "proper." The two features of the crooked legs and the underhung jaw are simply selected and perpetuated deformities. The projection of the lower jaw and the receding of the nose are extremely marked, and give the Dog a most sinister appearance. The chest of a good Bull-dog is very broad and strong. The hind-quarters, on the other hand, are comparatively feeble.

The Bull-dog was formerly used—as its name implies—for the barbarous "sport" of Bull-baiting, in which our forefathers took so much delight. The Dog would seize upon the Bull's nose and lip, and no power in heaven or earth could make him leave his hold. He would even fight with the Lion, and seize upon his gigantic antagonist again and again, although torn and mangled all over with great claw-wounds.

Although not a water-dog, the Bull-dog is a capital swimmer, his immense strength and indomitable pluck giving him an advantage over even such a professed swimmer as the Newfoundland. "During a heavy gale, a ship had struck on a rock near the land. The only chance of escape for the shipwrecked was to get a rope ashore; for it was impossible for any boat to live in the sea as it was then running. There were two Newfoundland Dogs and a Bull-dog on board. One of the Newfoundland Dogs was thrown overboard, with a rope thrown round him, and perished in the waves. The second shared a similar fate; but the Bull-dog fought his way through that terrible sea, and, arriving safe on shore, rope and all, became the saviour of the crew."

Little is known as to the origin of the Bull-dog, but Mr. Darwin makes the curious and interesting statement that "some authors who have written on Dogs maintain that the Greyhound and Bull-dog, though appearing so different, are really closely-allied varieties, descended from the same wild stock; hence I was anxious to see how far their puppies differed from each other. . . . On actually measuring the old Dogs and their six-day-old puppies, I found that the puppies had not acquired nearly the full amount of proportional difference."

THE BULL-TERRIER

is a cross between the Bull-dog and the Terrier, and is generally superior, both in appearance and value, to either of its progenitors. "A second cross considerably lessens the underhanging of the lower jaw, and a third entirely removes it, retaining the spirit and determination of the animal."

THE MASTIFF.

This Dog "is probably an original breed peculiar to the British Islands." It is larger than the Bull-dog, has a head of somewhat the same shape, with deep flews, but its ears are pendent, and it has none of the Bull-dog's deformity. (See figure on p. 109.) From the Bloodhound it is distinguished by the shape of the head, which is rounder and shorter, and by the absence of the red ring round the eye. At the present day, the Mastiff is used chiefly as a house Dog, for which purpose his fidelity and strength make him thoroughly well suited.

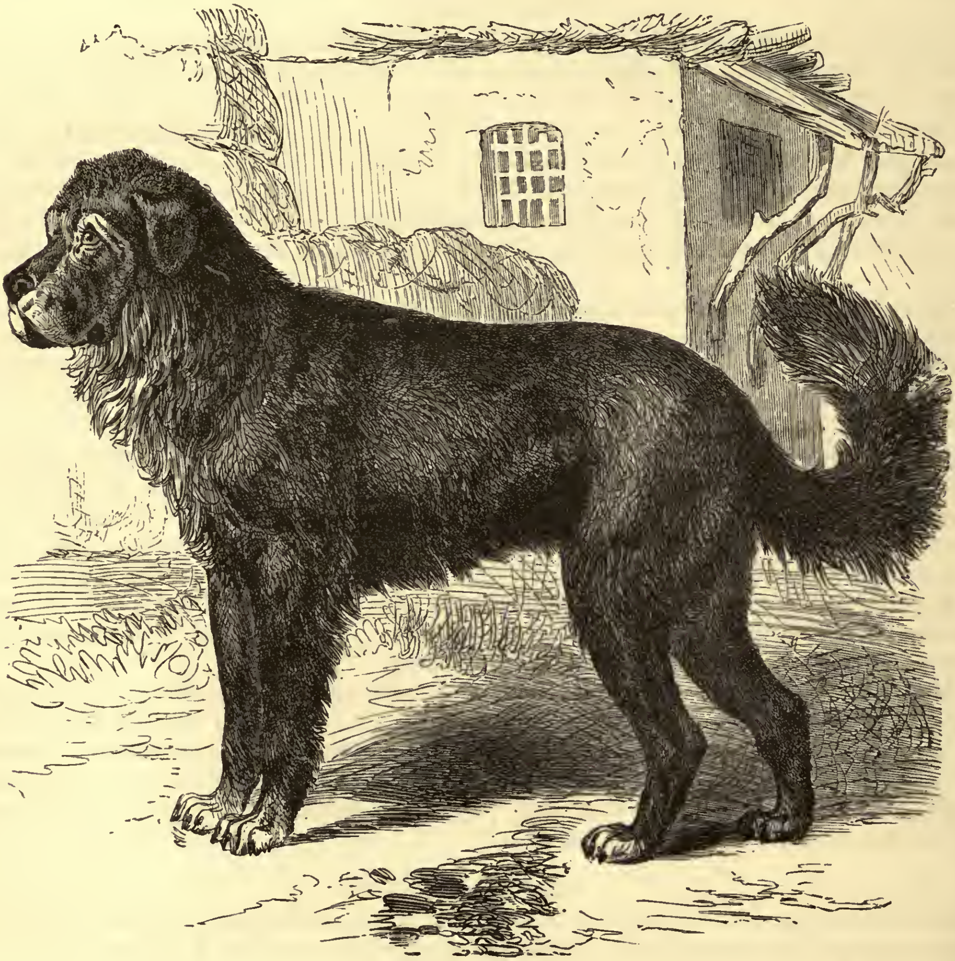
THE CUBAN MASTIFF

is about intermediate in size between the Bull-dog and the English Mastiff; in appearance it closely resembles the latter. It is an extremely savage Dog, and was used in the days of slavery for tracking runaway negroes. It is now used as a watch Dog, and, by the Spaniards, for Bull-fighting.

THE TIBET DOG.

This magnificent animal is kept by the Bhoteas, a race inhabiting the table-lands of Tibet, who use it as a watch Dog. It is about the size of a Newfoundland Dog, but with a head more like that of a Mastiff, the "flews," or pendent side-flaps of the upper lip, being of great size. The hair is long, and the tail bushy and well curled.

Mr. Bennett says of some specimens kept in the Zoological Gardens many years ago, that they "were larger than any English Mastiff we have seen. Their colour was a deep black, slightly clouded on the sides; their feet and a spot over each eye alone being of a full tawny or bright brown. They had the broad, short, truncated muzzle of the Mastiff, and lips still more deeply pendulous." In disposition they are—at any rate in their native country—"tremendously fierce, strong, and noisy; and while savage by nature, or soured by confinement, so impetuously fierce, that it is unsafe, unless the keepers are near, even to approach their dens."



TIBET DOG.

This Dog was known to the Greeks and Romans, whose writers mention its fierce conflicts with the Aurochs, the Wild Boar, and even the Lion.

THE ENGLISH TERRIER.

This is a small Dog, with a good forehead, prominent eye, pointed muzzle, and usually short hair. The colour varies greatly—white and black-and-tan being perhaps the commonest hues; in the latter case, there is always a tan-coloured spot on the eye, a circumstance which it is interesting to remark, as a similar spot occurs in nearly all black Dogs with tan-coloured feet.

The Terrier is used for unearthing the Fox, but his chief accomplishment is Rat-killing, in which noble sport he is a great adept. "There are some extraordinary accounts of the dexterity, as well as courage, of the Terrier in destroying Rats. The feats of a Dog called 'Billy' will be long remembered. He was matched to destroy one hundred large Rats in eight minutes and a half. The Rats were brought into the ring in bags, and as soon as the number was complete, he was put over the railing. In six minutes and thirty-five seconds they were all destroyed. In another match he destroyed the same number in six minutes and thirteen seconds. At length, when he was getting old, and had but two teeth and one eye left, a wager was laid of thirty sovereigns, by the owner of a Berkshire Bitch, that she would kill fifty Rats in less time than Billy. The old Dog killed his fifty in five minutes and six seconds. The pit was then cleared and the Bitch let in. When she had killed thirty Rats she was completely exhausted, fell into a fit, and lay barking and yelping, utterly incapable of completing her task."

THE SCOTCH TERRIER

has a large head, short stout legs, and long, rough, shaggy hair. The colours of the pure breed are black and fawn. This breed is probably of more ancient origin than the English Terrier. It is an extremely intelligent, faithful, and affectionate animal, and, like its relative from south of the Border, a great Rat-catcher. The "*Dandie Dinmont*" breed, so well known from the immortal Pepper and Mustard in "Guy Mannering," is a variety of the Scotch Terrier; so also is the *Skye Terrier*, which is distinguished by its long hair and short legs. In all these Terriers, as well as in the English breed, a black nose and black roof to the mouth are points of importance.

PARIAH DOGS.

Having considered the chief *bonâ fide* varieties of the Dog, we come, lastly, to those nondescript animals, the *Pariahs*, or domesticated Dogs run wild, which occur in packs in many parts of Eastern Europe and of Asia. These herds of miserable, half-starved animals are undoubtedly not true wild Dogs, but degenerated tame ones, the Dog being derived from a wild ancestor, under certain circumstances shows his descent by reverting to the habits of his forbears. Instances of this occur occasionally in the case of even the better breeds of Dogs. For instance: "A black Greyhound Bitch, belonging to a gentleman in Scarisbrick, in Lancashire, though she had apparently been well broken-in and always well used, ran away from the habitation of her master, and betook herself to the woods. She killed a great many Hares and made free with the Sheep, and became an intolerable nuisance to the neighbourhood. She was occasionally seen, and the depredations that were committed were brought home to her. Many were the attempts made to entrap or destroy her, but in vain; for more than six months she eluded the vigilance of her pursuers. At length she was observed to creep into a hole in an old barn. She was caught as she came out, and the barn being searched three whelps were found, which, very foolishly, were destroyed. The Bitch evinced the utmost ferocity, and, although well secured, attempted to seize every one who approached her. She was, however, dragged home, and treated with kindness. By degrees her ferocity abated. In the course of two months she became perfectly reconciled to her original abode, and a twelvemonth afterwards (1822), she ran successfully several courses. There was still a degree of wildness in her appearance; but, although at perfect liberty, she seemed to be altogether reconciled to a domestic life."

Captain Williamson says "that many persons affect to treat the idea of degeneration in quadrupeds with ridicule; but all who have been any considerable time resident in India must be satisfied that Dogs of European breed become, after every successive generation, more and more similar to the Pariah, or indigenous Dog of that country. The Hounds are the most rapid in their decline, and, except in the form of their ears, they are very much like many of the village curs. Greyhounds and Pointers also rapidly decline, although with occasional exceptions. Spaniels and Terriers deteriorate less; and Spaniels of eight or nine generations, and without a cross from Europe, are not only as good as, but far more beautiful than, their ancestors. The climate is too severe for Mastiffs, and they do not possess sufficient stamina; but, crossed by the East Indian Greyhound, they are invaluable in hunting the Hog."

The Pariah Dogs occur in Turkey, Egypt, Syria, China, India, &c., varying a good deal according to their abode. Their habits are well described by Mr. G. R. Jesse, whose account of the Egyptian Pariah will apply equally well to that of Constantinople, or of any other place where sanitary regulations are simply *nil*, and where the Dogs are the only creatures who make any attempt to clear the place of fever-breeding filth.

"The Dogs of the Egyptian towns are masterless, and live on carcases thrown out on the mounds of rubbish outside the walls and what is cast them by the charitable. In the villages, and with the shepherds along the desert, they are better cared for, protecting the property of the people from thieves, and their animals from wild beasts. These Dogs are generally sandy in colour, but they vary—some are black, and others white. At Ermeret, near Thebes, is a breed of black Dogs, quite different from those of Lower Egypt—fierce, excellent watchers, having roughish wiry hair, and drooping but small ears: they are stated to be derived from the Slowara Arabs. Numbers of Dogs congregate on some of the rubbish mounds outside the gates and walls of Cairo, and live on the carcases of Horses, Asses, &c., which are thrown there, the Arabs not having arrived at that pitch of Western economy which terminates the utility of a beast of burden at a cheap restaurant. These masterless Dogs act as scavengers, in which capacity they are accompanied by the large black-and-white yellow-billed Carrion Hawk, Kites, and troops of black-and-grey Carrion Crows. Among the skeletons, and scattered bones, heads, and hoofs, these Dogs—about two feet in height, generally of a yellow colour, or black, or a dirty white, smooth-skinned, and mostly with erect pointed ears—may be seen in crowds, their mouths and necks bloody, snarling, snapping, fighting, tearing, and gorging to repletion. The bitches scratch holes in the rubbish-heaps, and there bring forth their young. After the bones of the dead animals are cleared of flesh by the Dogs, bundles of them are collected and carried off by women and children. The Dogs of the town associate in bands, and each band has its district and its chief. No other Dog is permitted to enter the territory without being at once assailed. If, however, a Dog wishes to pass from one quarter of the town to another, he is said to creep along with his tail down in a humble manner, and immediately the Dogs of that part come upon him to throw himself on his back, and deprecate their attack. After due examination, he is allowed to proceed, but repeats his submissive actions whenever he meets new foes, and so, after enduring repeated challenges, gains his destination. These Dogs are still and quiet during the day (unless, indeed, an European comes in sight, when their vociferousness is loud and long), but at night they are very vigilant, and guard the bazaars against the nocturnal thief."

In some parts of India the superfluous Pariahs are utilised by giving them as food to caged Tigers. An anecdote is related of one who proved himself a match for the Tiger, and who was, as a reward, admitted to close intimacy with the royal beast.

"I knew an instance," says Captain Williamson, "of one that was destined for the Tiger's daily meal standing on the defensive, in a manner that completely astonished both the Tiger and the spectator. He crept into a corner, and whenever the Tiger approached, seized him by the lip or the neck, making him roar most piteously. The Tiger, however, impelled by hunger—for all supply of food was purposely withheld—would renew the attack. The result was ever the same. At length the Tiger began to treat the Dog with more deference, and not only allowed him to partake of the mess of rice and milk furnished daily for his subsistence, but even refrained from any attempt to disturb him. The two animals at length became reconciled to each other, and a strong attachment was formed between them. The Dog was then allowed ingress and egress through the aperture; and, considering the cage as his home, he left it and returned to it just as he thought proper. When the Tiger died he moaned the loss of his companion for a considerable period."

In Siam, these unhappy creatures are equally abundant, and are even worse off. Mr. Thomson* states that they occur in great numbers in nearly all the temples. "It is contrary to the Buddhist creed to take away life; hence many of their temples become places of refuge for troops of famished Dogs, who remain there till they die; for though the priests give them what food they can spare, there is never enough for them all. These Dogs, then, are usually animated skeletons, their skins destitute of hair, and covered with many sores. I tossed them a little food; it gave rise to the most savage fight I ever witnessed. One or two wretched curs limped away from the strife, torn and lacerated, probably to lie down and die. This canine community—fierce, hungry, and diseased—must surely be one of those many Buddhist hells where sorcerers expiate their crimes. The animals are deemed to be animated by the spirits of the departed, and are undergoing a lifetime of torture. The priests, if they are good men, look on at their misery with pious complacency, and probably take the lesson to heart, lest they, too, in the next stage of their existence, should be condemned to howl for offal or garbage to satisfy the hungry pangs and sore-eaten frames of starving Pariah Dogs."

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* "The Straits of Malacca, Indo-China, and China."

DINGO.

THE INDIAN WILD DOG.*

This animal, which exists in large numbers all over the peninsulas of India and Malacca, differs so much from the ordinary Dogs, that it has been proposed to separate it from them under a different generic name, *Cuon.* Its distinctive characters are, however, by no means sufficiently great to warrant this separation. It occurs, under slightly different varieties, in different parts of India, and receives various native names. By the Mahrattas it is called *Kolsun* (*Canis dukhunensis* of Colonel Sykes); *Sona kúta*, or Golden Dog, in Central India; *Buansú* in the Himalayas; *Dhole* in Ceylon, and so on.

A capital notion of the appearance of this interesting Dog may be obtained from a case of stuffed specimens now in the India Museum at South Kensington. The Zoological Society has at different times been able to exhibit in their Gardens more or less fine examples of the Indian Wild Dog. Dr. Murie gives the following account of a male and female specimen sent to the Gardens some time ago :—

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* *Canis primævus.*

"Their *tout ensemble* conveyed to me the idea of a compound between Wolf, Jackal, and Fox, partly on account of their colour, partly from their size and general shape, and also partially from the contour of the head, ear-outline, and direction of the eyes. But, on the other hand, a critical inspection left the impression that they were more markedly of the Dog type. This pair of animals very nearly corresponded in size," the most important dimensions being—length, from snout to tip of tail, forty-two inches; length of the tail, twelve inches; height at shoulder, about fifteen inches, and at the loins about sixteen inches.

"Their colour was entirely reddish or fulvous brown, and remarkably like the tint of a Fox. The tip of the nose and lower part of the face was somewhat darker; the tail also exhibited deepening of hue. Moreover, upon the outer side of the hind-leg, and similarly on the fore-limb, there was a tendency, though a very indistinct one, to whitish spotting. . . . Of those features marking race, the tail was moderately lengthened, dark, and full below, as in the Jackal or Wolf, and not with the great round brush of the Fox. The eye had a certain obliquity; but the pupil, as far as I could ascertain, was round. Ears large, erect, and hairy."

"I am not cognisant of any observations as to their habits having been noted prior to their receipt by the Society. But I may mention that when in the Gardens they were exceedingly active, snapping, snarling, and in their general behaviour resembling a couple of Wolves rather than sedate Dogs. I am not aware that they were heard to bark; but occasionally they howled and whined."

The Wild Dog has thus, in many respects, an appearance resembling that of a Fox or a Jackal, with which it also agrees in its filthy smell. It is, however, a true Dog, although less specialised than the domestic kinds, and therefore approaching the average structure of the wild *Canidæ*.

These Dogs hunt in packs, six, eight, ten, or as many as thirty, animals in a pack. They hunt either by night or day; and it is said that "when once a pack of them put up any animal, no matter whether Deer or Tiger, that animal's doom is sealed; they never leave it. They will dog their prey for days, if need be, and run it down exhausted, and if it turns to fight, they go in fearlessly, and by their numbers win. All animals dread the Wild Dog; others they may elude by speed, artifice, or battle: but their instinct tells them that there is no escaping the Wild Dog, as it hunts in packs by scent as well as by sight, and is as brave as it is persevering."

They make no noise when running, except sometimes a low whispering kind of note, which may either express their own gratification, or act as a signal to other Dogs. Great numbers of them are destroyed in their hunting expeditions, as the larger animals, such as the Elk and Boar, defend themselves with great fierceness, and sacrifice many of their pursuers before they fall a victim to the overwhelming numbers and unconquerable perseverance of the latter.

In some parts of India they are half-domesticated, and used in the noble sport of "Pig-sticking." "They are remarkably savage, and frequently will approach none but their *doonahs*, or keepers, not allowing their own masters to come near them. Some of them are very fleet, but they are not to be depended upon in coursing; for they are apt suddenly to give up the chase when it is a severe one, and, indeed, they will too often prefer a Sheep or a Goat to a Hare. In Hog-hunting they are more valuable. It seems to suit their temper, and they appear to enjoy the snapping and the snarling incident to that species of sport."*

THE DINGO, OR AUSTRALIAN WILD DOG.†

This is another distinct breed of Wild Dog, quite as remarkable in its way as the Indian Wild Dog, and possessing far greater interest than the latter, from the fact that it is the only Mammal not belonging to the group of Marsupials, or pouched animals (Kangaroos, Wombats, &c.), found in the great island of Australia. In all probability, it is not a true native even there, but was most likely introduced before the discovery of the island by Europeans.

The Dingo "approaches in appearance to the largest kind of Shepherd's Dog (see figure on page 147). The head is elongated, the forehead flat, and the ears short and erect, or with a slight direction forwards. The body is thickly covered with hair of two kinds—the one woolly and grey, the other silky and of a deep yellow or fawn colour. The limbs are muscular, and, were it not for the suspicious yet ferocious glare of the eye, he might pass for a handsome Dog. When he is running, the head is lifted more than usual in Dogs, and the tail is carried horizontally. He seldom barks." *

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* Williamson, quoted by Youatt.

† *Canis dingo.*

There are some Dingoes in the Zoological Gardens, and one would never guess their savageness of disposition from their innocent faces. They are decidedly good-looking Dogs in appearance, but as regards temper they are anything but pleasant animals, although quite tamable if taken young: they are, indeed, often domesticated by the natives, but are never known to attain to those higher qualities which make the thoroughly civilised Dog so valuable.

"When Van Diemen's Land began to be colonised by Europeans, the losses sustained by the settlers by the ravages of the Wild Dogs were almost incredible. The districts infested by these animals were principally those appropriated to Sheep, and there was scarcely a flock that did not suffer. It was in vain to double the number of shepherds, to watch by night and day, or to have fires at every quarter of the field; for these animals would accomplish their object by stratagem or force. One colony lost no fewer than 1,200 Sheep and Lambs in three months; another colony lost 700.

"The ravagers were either the native Wild Dogs of the island or those that had escaped from their owners. They seemed to have apportioned the country into different districts, each troop having its allotted range. At length the evil became so great, that a general meeting of the colonists was convened. The concluding sentences of the speech of Lieutenant Hill forcibly express the extent of the evil:—'The country is free from bushrangers: we are no longer surrounded and threatened by the natives. We have only one enemy left in the field; but that enemy strikes at the root of our welfare, and through him the stream of our prosperity is tainted at its very source.' The colonists were then few, but they cordially united in the endeavour to extirpate this formidable enemy; and, although the Wild Dog is still found in the interior of the island, he is comparatively seldom seen, and his ravages have nearly ceased." †

CHAPTER IX.

THE DOG FAMILY.—WOLVES—JACKALS—FOXES, ETC.

THE WOLF—Historical Account—Geographical Distribution—Characteristics—Habits—Destructiveness—Tame Wolves—Varieties of the Wolf—THE PRAIRIE WOLF—THE RED WOLF—THE JACKAL—Its Character—Habits—"Jackal's Horn"—Occurrence—THE BLACK-BACKED JACKAL—THE SENEGAL JACKAL—THE AGUARA—THE COMMON FOX—Characters distinguishing it from the true Dogs—Its Habits—Cunning—Occurrence—THE ARCTIC FOX—Its Supposed Change of Colour according to Season—Its Habits—The Value of its Skin THE FENNEC—THE LONG-EARED FOX—Why made a Distinct Genus—THE RACOON DOG—THE HYÆNA DOG—Its Character and Habits.

THE WOLF.‡

WE have considered all the most important "beasts of prey," with two exceptions, under the Cat family, to which they belong. Two important ravagers still remain—the Bear, of which we shall speak by-and-bye, and the Wolf, whose turn has now come. Of the great Cats, much good is often spoken. Notwithstanding their cruelty and bloodthirstiness, they are handsome, strong, and usually courageous: each one hunts his prey for himself, and when he has satisfied his appetite, leaves the remainder to inferior beasts, disdaining, unless when reduced by starvation, to touch any but fresh meat. The Bear, too, often has a word said for him: his curious, half-good-natured look, his semi-human waddle, the tricks he is capable of learning, all combine to make him seem not so very objectionable a beast after all. But who ever heard any good said of a Wolf? There have, indeed, been a few instances of Wolves in captivity who have shown much affection and fidelity to their masters; but, under ordinary circumstances, cruel, cowardly, dastardly, greedy, pitiless, are the adjectives applied to him.

The Wolf has a place in history as venerable as that of the Lion, and he was the dread of the shepherd four thousand years ago. A very old Sheep-master, addressing his sons on his death-bed

* Youatt.

† Youatt.

‡ *Canis lupus.*

—these sons being, eleven out of twelve of them, shepherds—said of the youngest:—"Benjamin shall ravin as a Wolf: in the morning he shall devour the prey, and at night he shall divide the spoil."

Homer also, in his immortal "Iliad," frequently brings in the Wolf, giving with a few master-touches a vivid picture of the hated brute's habits:—

"Sudden as hungry Wolves the Kids purloin,
Or Lambs, which haply some unheeding swain
Hath left to roam at large the mountains wild;
They, seeing, snatch them from beside the dams,
And rend incontinent the feeble prey."

——"As Wolves that gorge
The prey yet panting, terrible in force,
When on the mountains wild they have devour'd
An antler'd Stag new-slain, with bloody jaws
Troop all at once to some clear fountain, there
To lap with slender tongues the brimming wave;
No fears have they, but at their ease eject
From full maws flatulent the clotted gore."

The ancient Greeks and Romans had a very curious superstition about the Wolf. They believed that if a man and a Wolf met, and the beast saw his human enemy before the latter caught sight of him, the man became dumb. Hence the Greek proverb, λύκον ἰδεῖν, "to see a Wolf," that is, to be struck dumb. Virgil expresses the same notion in his "Bucolics"—

"Nunc oblita mihi tot carmina: vox quoque Mœrim
Jam fugit ipsa: lupi Mœrim videre priores." *

There are many ancient proverbs of which the Wolf is the theme; one is often used now, "*lupus in fabula*," used in much the same sense as "Talk of the Devil." Then there is "*ovem lupo committere*," equivalent to our "set the Fox to watch the Geese"; "*hac urget lupus, hac canis angit*," of much the same significance as "a Donkey between two bundles of hay"; and many others.

We have said that the Wolf is everywhere detested; there is an historical exception to this. He was held in great veneration and even worshipped by the ancient Egyptians, who often embalmed his body, and one of whose cities, Lycopolis (the modern Siout), was named after him.

The Common Wolf is still very abundant in many parts of Europe, being found in Spain, Greece, Italy, France, Eastern Germany, Poland, Russia, Sweden, Norway, and Lapland. In Switzerland they are now rare, and in the remainder of the Continent extinct.

It is very curious to think that such a beast as the Wolf should now flourish in a neighbouring country like France, as we have quite forgotten the time since any plague of the sort existed in England. And yet it is barely two centuries since they were finally got rid of, and in early times they were quite common over a great part of the island, and, of course, did an immense amount of damage. One Saxon king, Edgar, "applied himself to their extirpation in earnest, enlisting English criminals in the service, by commuting the punishment awarded for their crimes to the delivery of a certain number of Wolves' tongues, and liberating the Welsh from the payment of the tax of gold and silver, on condition of an annual tribute of three hundred Wolves. But the vast wild tracks and deep forests of ancient Britain were holds too strong even for his vigorous measures. What the number and consequent danger had been may be imagined from the necessity that existed, in the previous reign of Athelstan (A.D. 925), for a refuge against their attacks. Accordingly, a retreat was built at Flixton in Lancashire, to save travellers from being devoured by these gaunt hunters. The Saxon name for the month of January, 'Wolf-moneth,' in which dreary season hunger probably made the Wolves more desperate, and the term for an outlaw, 'Wolfshead,' implying that he might be killed with as much impunity as a Wolf, also indicate the numbers of these destructive beasts, and the hatred and terror which they inspired.

* Virgil, Ec. ix., 53:—

"All, all forgotten now, those youthful lays;
My voice will follow, ay, my voice decays;
The Wolf hath eyed me first, hath Mœris eyed."

"That Edgar failed in his attempts at extirpation is manifest from a *mandamus* of Edward I., to all bailiffs, &c., to give their assistance to his faithful and beloved Peter Corbet, whom the king had enjoined to take and destroy Wolves . . . in all forests and parks and other places in the counties of Gloucester, Worcester, Hereford, and Salop, where they could be found. . . . Even so late as 1577, the flocks of Scotland appear to have suffered from the ravages of Wolves, which do not seem to have been rooted out of that portion of the kingdom till about the year 1680, when Sir Ewen Cameron's hand laid the last Wolf low. In Ireland, Wolves must have lingered as late as the year 1710; about which time the last presentment for killing them in the county of Cork was made."

The Wolf is about the size of a large Shepherd's Dog, measuring some five feet from snout to tip of tail: of this length about twenty inches are taken up by the tail. The height at the shoulders is about thirty-two inches. The skin is of a dark yellowish-grey colour, or sometimes almost black; the hair is long and coarse in the northern varieties, which have to sustain existence through a long, cold winter, and shorter in the southern kinds, which enjoy a warmer climate. There is also a good deal of variation in colour, according to the country from which the animal comes.

The muzzle has much the same shape as that of many Shepherd's Dogs, but the ears are very upright and pointed, and the eyes are set obliquely; in this respect the difference between a Wolf and a Dog is very striking—the obliquity of the eye in the former gives him a most sinister expression. The pupil of the eye is round. The bushy tail, too, is not curled up like a Dog's, but held down, almost between the hind legs. But perhaps the most striking difference from the Dog is in the voice; the Wolf never barks—that is entirely a civilised habit: even Dogs allowed to become wild lose it—but howls in a horrible and ghastly manner.

The Wolf usually lives in solitary places in mountains; but in Spain he is said sometimes to make his lair in corn-fields, in close proximity to inhabited dwellings. Here he lives with his wife and family, usually *caché* during the day, and issuing forth at night to take his prey. During the warmer periods of the year Wolves, as a rule, hunt each one for himself, but in the winter they often unite into great packs, and pursue their prey over the snow at a rapid pace and with indomitable perseverance. Swift and untiring must be the animal which, on an open plain, can escape from them; even the Horse, perfectly constructed as he is for rapid running, is almost certain to succumb, unless he can reach a village before his pace begins to flag. They never spring upon an animal from an ambush—the nearest approach ever made to such a mode of attack being their practice of attacking sheepfolds by leaping into the midst of the flock and killing right and left; when they reach their prey, too, the first onslaught is made with the teeth, and never by a blow of the paw. Thus, a Wolf's attack—like that of all members of the genus Canis—is entirely different from a Cat's. The Cat lies in ambush all alone, springs upon the passing prey, which, if he misses he scarcely ever pursues, and kills by a blow of the paw. The Dog and Wolf attack openly, sometimes alone, but oftener in company, pursue their prey with unflagging energy until it falls a victim, and give the death-wound at once with their teeth. To shepherds the Wolf is, and has been from the earliest times, a most unmitigated curse. A single Wolf will leap the wall of a sheepfold and murder perhaps a quarter or a third of the flock before his lust of slaughter is satisfied. Of course, he cannot eat more than one, or part of one, and the others he slays from wanton cruelty. Mutton is naturally his standing dish, as it can be procured, if at all, in abundance, and with comparatively little difficulty; but he is not at all particular, and will eat Deer, Goats, Birds, and even Reptiles. But his favourite meat, curious to relate, is *Dog*, and there are many instances related of the eagerness and recklessness shown by Wolves to obtain this cannibal feast. "Wolves have been known to carry off a Pointer from a sledge going at full gallop. The animal leaps with a single bound amongst the three or four persons in the vehicle, who remain stupefied at so much audacity, seizes his innocent victim, and plunges again into the forest. The whole is done in less time than it takes to tell. Another time, it is a young Newfoundland, which his master, travelling on horseback, has placed before him, on the pommel of his large saddle; the Wolf sees him, leaps upon and seizes him, and carries him off without touching man or horse."*

If the Wolf confined himself to Sheep and Dogs, matters would be bad, indeed, but still endurable; unfortunately, however, this horrible savage likes human flesh just as well as "flesh of muttons, beefs, or goats." A single Wolf hardly ever dares attack a man, for he is essentially a cowardly animal, but a child may be now and then carried off, and a man or a body of men may be attacked by an immense troop of Wolves, and then, unless they can get to a village or some other shelter, their fate is sealed. They may kill the Wolves by dozens, expend all their ammunition, making every shot tell, fell the howling monsters till their swords are hacked like Falstaff's, but it is all of no avail: each falling Wolf is replaced by a fresh one hungrier and more vigorous than himself, and the end, unless succour come, can only be death by the teeth and a grave in the maw of perhaps hundreds of Wolves. It is related that, in 1812, twenty-four French soldiers were attacked by Wolves, and after a hard fight, were all slain and devoured; their comrades found only the remains of their arms and uniforms, together with a few bones, and the bodies of two or three hundred Wolves who had fallen in the unequal struggle, only to add to their comrades' banquet.

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* L. Énault, quoted by Brehm.

COMMON WOLF.

The destruction wrought by these animals in countries where they abound is very great. "In 1823, in Livonia, a declaration made to the authorities stated, as having been carried off by Wolves, 15,182 Sheep; 1,807 Oxen; 1,841 Horses; 3,270 Goats; 4,190 Pigs; 703 Dogs; and 1,873 Fowls and Geese."

The Wolf, savage though he be, is quite tamable; he has often shown great devotion to his master, and has, in fact, behaved in every respect like an affectionate Dog, a very interesting fact, as bearing upon the evolution of Dogs from wild *Canidæ.*

The most remarkable instance of this with which we have met is the following, which shows the Wolf to be—what one would never suspect him to be—capable of that almost superhuman affection, which is sometimes exhibited by Dogs:—" A lady near Geneva had a tame Wolf, which seemed to have as much attachment to its mistress as a Spaniel. She had occasion to leave home for some weeks. The Wolf evinced the greatest distress after her departure, and at first refused to take food. During the whole time she was absent he remained much dejected. On her return, as soon as the animal

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YOUNG WOLVES.

heard her footsteps, he bounded into the room in an ecstasy of delight. Springing up, he placed one paw on each of her shoulders, but the next moment he fell backward and instantly expired."*

There are several varieties of the Wolf besides the common European kind, most of which have been considered by different authors as distinct species, and some of which are even now so considered, though the differences between them are so very slight and unimportant, that it seems hardly advisable to look upon them as anything more than *geographical species*—varieties produced by difference of climate and other surroundings.

"The Black Wolf is a name given to a variety which is most frequent in Southern Europe, and particularly in the Pyrenees, and to the south of those mountains, where they are more common than the ordinary Wolf, which the Black Wolf equals in stature, and, if anything, exceeds in strength. Cuvier says it is found, but very rarely, in France."

The Wolf found in Palestine, the subject of so many references in the Old Testament, is, according to Canon Tristram, a very well-marked variety. He says of it:—

"The Wolf is the dread of the shepherd from one end of the country to the other, and a single Wolf is far more destructive than a whole pack of Jackals. Again and again I have put up the Syrian Wolf and fired at it without success. Near Beersheba, in the hill country, in the forests of Bashan and Gilead, in the ravines of Galilee and Lebanon, and in the maritime plains, it is alike distributed. I never saw two together, and I never heard of them hunting in packs. It is much to be wished that some traveller may be able to secure a specimen for examination, for it may possibly prove to be a distinct variety. It is of a lighter fawn colour than any European Wolf I ever saw, and appears decidedly larger. I can confirm the statement of Dr. Russell, that the natives speak of another larger and fiercer species called 'Sheeb,' but I could never obtain any clear definition of the distinctions between the two."

The Wolf of India, abundant in the open country, rare in the wooded districts over the whole of the great peninsula, is considered, by authorities such as Mr. Blyth and Dr. Jerdon, as a distinct species, and is called *Canis pallipes*.

"The Wolves of the Southern Mahratta country," says Mr. Elliot, "generally hunt in packs, and I have seen them in full chase after the Goat-Antelope (*Gazella Bennettii*). They likewise steal round a herd of Antelopes, and conceal themselves on different sides, till an opportunity offers of seizing one of them unawares, as they approach, whilst grazing, to one or other of their hidden assailants. On one occasion three Wolves were seen to chase a herd of Gazelles across a ravine in which two others were lying in wait. They succeeded in seizing a female Gazelle, which was taken from them. They have frequently been seen to course and run down Hares and Foxes; and it is a common belief of the Ryots that in the open plains, where there is no cover or concealment, they scrape a hole in the earth, in which one of the pack lies down, and remains hid, while the others drive the herd of Antelopes over him. Their chief prey, however, is Sheep; and the shepherds say that part of the pack attack and keep the Dogs in play, while others carry off their prey, and that if pursued they follow the same plan, part turning and checking the Dogs, whilst the rest drag away the carcass till they evade pursuit. Instances are not uncommon of their attacking man. In 1824, upwards of thirty children were devoured by Wolves in one pergunnah alone. Sometimes a large Wolf is seen to seek his prey singly. These are called *Won-tola* by the Canarese, and reckoned particularly fierce."

This Indian Wolf has dingy reddish-white fur, some of the hairs being tipped with black; the lower parts are dingy white, the tail slightly tipped with black.

Closely allied to the Indian Wolf is a variety from Tibet, "*Canis laniger*, sometimes called the 'White Wolf' by sportsmen who cross the Himalayas. It is the Chángú of Tibet, *Chankodi*, near the Niti Pass from Kumaon; and it is a larger animal than the Indian Wolf, with white face and limbs, and no dark tip to the tail, which is fully brushed. The hair is extremely woolly," this peculiarity being, of course brought about by the cold climate to which the animal is exposed. Tibet also boasts another variety, the Red or Golden Wolf, which is fulvous, with greyish-brown head, and with the lower parts pure white. A third variety, with black shaggy fur, and sometimes known as *Canis niger*, exists in the same country.

The North American Wolf, which extends from Greenland in the north to Mexico in the south, is often separately considered as *Canis occidentalis.* It differs from the European kind chiefly in its fur being finer, denser, and longer, and in the curious fact that its feet are, as Sir John Richardson remarks, very broad, so as to enable it to run easily on the snow. The development of these natural snow-shoes in the American Wolf fitting it so beautifully for its particular mode of life is highly interesting. This species is entirely absent from South America, but its wide distribution in North America may be gathered from Richardson's account:—

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* Jesse: "History of the British Dog."

"Wolves are found in greater or less abundance in different districts, but they may be said to be very common throughout the northern regions; their footmarks may be seen by the side of every stream, and a traveller can rarely pass a night in these wilds without hearing them howling around him. They are very numerous on the sandy plains which, lying to the eastward of the Rocky Mountains, extend from the sources of the Peace and Saskatchewan Rivers towards the Missouri. There bands of them hang on the skirts of the Buffalo herds, and prey upon the sick and straggling Calves. They do not, under ordinary circumstances, venture to attack the full-grown animal; for the hunters informed me that they often see Wolves walking through a herd of Bulls without exciting the least alarm; and the marksmen, when they crawl towards a Buffalo for the purpose of shooting it, occasionally wear a cap with two ears, in imitation of the head of a Wolf, knowing from experience that they will be suffered to approach nearer in that guise."*

The American Wolf extends into Greenland, where the Eskimo take it in traps of a very novel construction, "made of strong slabs of ice, long and narrow, so that a Fox can with difficulty turn himself in it; but a Wolf must actually remain in the position in which he is taken. The door is a heavy portcullis of ice, sliding in two well-secured grooves of the same substance, and is kept up by a line, which, passing over the top of the trap, is carried through a hole at the farthest extremity; to the end of the line is fastened a small hoop of whalebone, and to this any kind of flesh bait is attached. From the slab which terminates the trap a projection of ice, or a peg of wood or bone, points inwards near the bottom, and under this the hoop is lightly hooked; the slightest pull at the bait liberates it, the door falls in an instant, and the Wolf is speared where he lies."

There are no less than five varieties of the North American Wolf, to all of which separate specific names have been given by authors. They are: the Common Grey Wolf (*Lupus griseus*), the White Wolf (*Lupus albus*), the Pied Wolf (*Lupus sticte*), the Dusky Wolf (*Lupus nubilus*), and the Black Wolf (*Lupus ater.*) All these differ from one another only in the lesser details of colouring and other minor characters. In their habits they resemble one another entirely, and it is therefore unnecessary to do more than mention them.

The Coyote, or Prairie Wolf† occurs, along with the common North American Wolf, as far south as Mexico; its northern range being about the 55th degree of latitude.

"The Prairie Wolf has much resemblance to the Common Grey Wolf in colour; but differs from it so much in size, voice, and manners, that it is fully entitled to rank as a distinct species. It inhabits the plains of the Missouri and Saskatchewan, and also, though in smaller numbers, those of Columbia. On the banks of the Saskatchewan, these animals start from the earth in great numbers on hearing the report of a gun, and gather around the hunter in expectation of getting the offal of the animal he has slaughtered. They hunt in packs, and are much more fleet than the Common Wolf. I was informed by a gentleman who has resided forty years on the Saskatchewan, and is an experienced hunter, that the only animal on the plains which he could not overtake, when mounted on a good Horse, was the Prong-horned Antelope, and that the Meesteh-chaggoneesh, or Prairie Wolf, was the next in speed."

"The fur of the Prairie Wolf is of the same quality with that of the Grey Wolf, and consists of long hairs, with a thick wool at their base. The wool has a smoky or dull lead colour; the long hairs on the back are either white for their whole length, or they are merely tipped with black. The prevailing colour along the spine is dark blackish-grey, sprinkled with white hairs. Its cheeks, upper lip, chin, throat, belly, and insides of the thighs, are white. There is a light-brown tint upon the upper surface of the nose, on the forehead, and between the ears, on the shoulders, on the sides, where it is mixed with grey, and on the outsides of the thighs and legs. The tail is grey and brown, with a black tip. Some individuals have a broad black mark on the shins of the fore-legs, like the European

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* Richardson: "Fauna Boreali-Americana," 1829.

† *Canis latrans.*

COYOTE, OR PRAIRIE WOLF.

Wolf. The ears are short, erect, and roundish, white anteriorly and brown behind. The tail is bushy, and is clothed, like the body, with wool and long hair. Some specimens want the brown tints, and have most of the grey colour."* The length of body and head together amounts to about three feet; that of the tail about fourteen or fifteen inches.

The Red Wolf (*Canis jubatus*) of Brazil shows considerable resemblance both to the Jackals and to the Foxes. It has long, slender legs, a slender snout, long ears, and stiff, shaggy, reddish hair, raised into a mane along the neck.

THE JACKAL.†

Next to the Wolf, the Jackal is the most important wild member of the Dog tribe. It is a much smaller animal than the Wolf, not exceeding thirty inches in length, and seventeen in height at the shoulder. It is also distinguished from Wolves and true Dogs by its curious, long pointed muzzle. Its fur is of a dusky-yellowish colour—whence its name of "Loup doré," or gilded Wolf, and its specific appellation *aureus*—"the hairs being mottled black, grey, and brown, with the under fur brownish-yellow, the lower parts yellowish-grey, tail reddish-brown, ending in a darkish tuft." There is a good deal of variation from this colour, depending partly on the time of year, partly on the locality.

The Jackal is a cowardly animal, blessed with a most evil smell and with a voracious appetite. It lives largely upon carrion, a good deal of which it gets as a sort of "perquisite" from the remains of the Lion's feast. It is sometimes called "the Lion's provider," a name which "may have arisen from the notion that the yell of the pack gives notice to the Lion that prey is on foot, or from the Jackals being seen to feed on the remnants of the Lion's quarry." Dr. Jerdon says, "it is a very useful scavenger, clearing away all garbage and carrion from the neighbourhood of Cape Town, but occasionally committing depredations among poultry and other domestic animals. Sickly Sheep and Goats usually fall a prey to him; and a wounded Antelope is pretty certain to be tracked and hunted to death by Jackals. They will, however, partake freely of vegetable food."

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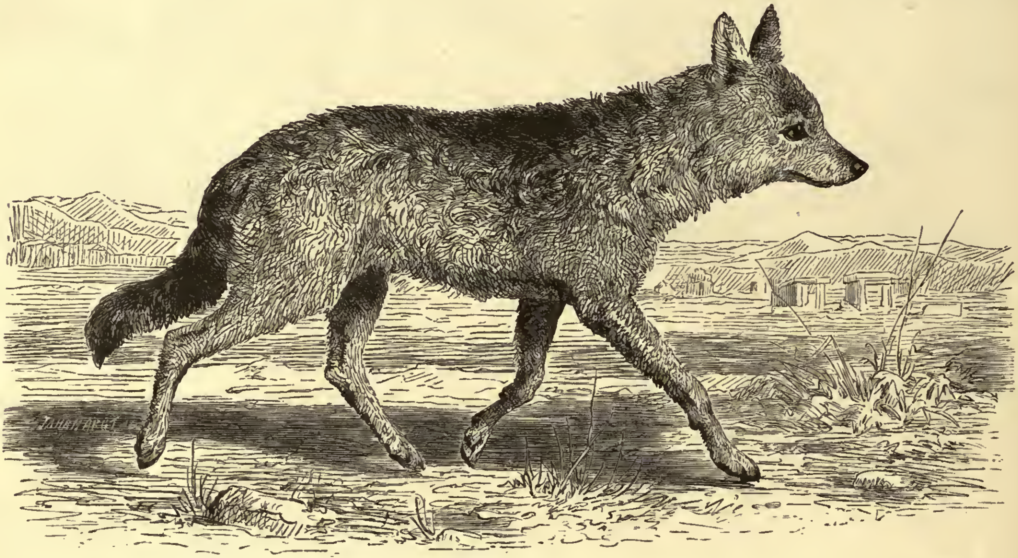
* Richardson.

† *Canis aureus.*

Like most other Dogs, the Jackal hunts in packs; and then, while on an expedition for food, makes night hideous by its fearful cries. In this it calls to mind the Hyæna, as well as in some other particulars, as, for instance, in its love for carrion, and in the remarkably cool way in which it will stare and laugh at travellers, as if holding them up to general ridicule.

The habits of the Jackal are altogether canine. Their hunts are conducted under the guidance of a leader, who is said to give the signal for every attack by a peculiar cry, and so powerful are these little animals in their union, that they are quite capable of pulling down a Deer. Their chief food in Ceylon seems to be Hares, the numbers of which they keep down to such an extent that those palatable Rodents are quite scarce in regions infested by Jackals.

The Jackal resembles, in one respect, the Fox, more than either the Wolf or Wild Dog. It has the reputation for excessive cunning, and indeed takes the place of our old vulpine friend, in the legends of the East. It is said that "when a Jackal has brought down his game and killed it, his first impulse is to hide it in the nearest jungle, whence he issues, with an air of easy indifference, to observe whether anything more powerful than himself may be at hand from which he might encounter the risk of being despoiled of his capture. If the coast be clear, he returns to the concealed carcass, and carries it away, followed by his companions. But if a man be in sight, or any other animal to be avoided, my informant has seen the Jackal seize a cocoa-nut husk in his mouth, or any similar substance, and fly at full speed, as if eager to carry off his pretended prize, returning for the real booty at some more convenient season."



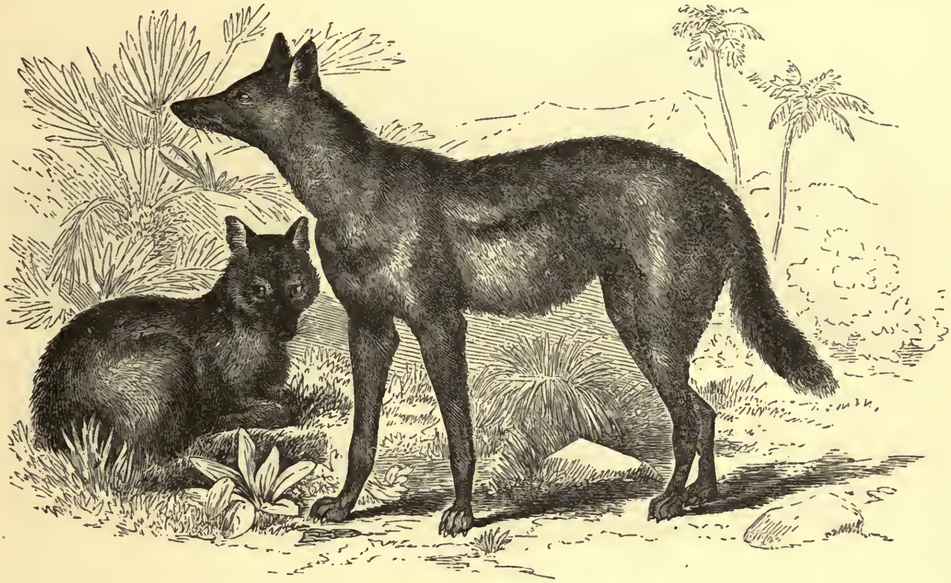
JACKAL.

Sir Emerson Tennent states that the Jackal, like the Domestic Dog, is subject to rabies, and that cattle frequently die from bites inflicted by them when in this condition.

"An excrescence is sometimes found on the head of the Jackal, consisting of a small horny cone, about half an inch in length, and concealed by a tuft of hair. This the natives call *Narri comboo;* and they aver that this 'Jackal's horn' only grows on the head of the leader of the pack. Both the Singhalese and the Tamils regard it as a talisman, and believe that its fortunate possessor can command, by its instrumentality, the realisation of every wish, and that if stolen or lost by him, it will invariably return of its own accord. Those who have jewels to conceal rest in perfect security, if along with them they can deposit a *Narri comboo,* fully convinced that its presence is an effectual safeguard against robbers.

"One fabulous virtue ascribed to the *Narri comboo* by the Singhalese is absurdly characteristic of their passion for litigation, as well as of their perceptions of the 'glorious uncertainty of the law.' It is the popular belief that the fortunate discoverer of a Jackal's horn becomes thereby invincible in every lawsuit, and must irresistibly triumph over every opponent. A gentleman connected with the Supreme Court of Colombo has repeated to me a circumstance, within his own knowledge, of a plaintiff, who, after numerous defeats, eventually succeeded against his opponent by the timely acquisition of this invaluable charm. Before the final hearing of the cause, the mysterious horn was duly exhibited to his friends; and the consequence was that the adverse witnesses, appalled by the belief that no one could possibly give judgment against a person so endowed, suddenly modified their previous evidence, and secured an unforeseen victory for the happy owner of the *Narri comboo!*"

Jackals have often been tamed; and, under the circumstances, behave exactly like the Domestic Dog: they fawn upon their masters, wag their tails, and throw themselves on their backs with all four paws in the air, altogether like Dogs. The chief drawback to their domestication is their abominable smell; but it is stated by Colonel Sykes that a tame female Jackal in his possession was quite devoid of this odour, while a recently-caught male, which was placed with her, smelt so horribly as to be almost unapproachable.



JACKAL OF SENEGAL.

The Common Jackal is found in Asia Minor, South-East Asia, including Persia and India, as far south as Ceylon, and in the North of Africa. The Black-backed Jackal (*Canis mesomelas*) is found in trans-Saharal Africa, from Nubia to the Cape. It is rather larger than the common kind, with longer ears and tail, a light red skin, with a black back-stripe. It is a very thievish animal, and is accused by some of the natives of eating off the tails of their Sheep.

The Jackal of Senegal (*Canis anthus*) is one of the best marked varieties of the Jackal, and has a strong claim to the distinction of a separate specific name. It is considerably larger than the common kind, more elegantly built, and has very long legs, almost like those of a Greyhound. It is of a bright tawny colour, with dark band on the back, side, and chest. It is one of the commonest animals in Central Africa, and "its habits are different to those of the Common Jackal. It is more prudent and suspicious, and is completely nocturnal. During the day it lies hidden in a safe retreat, and nothing but chance can reveal its presence to the hunter."

The Crab-eating Dog (*Canis cancrivorus*) is a Jackal approaching in many respects, especially in its long and bushy tail, to the Foxes. It is found in the savannahs of South America. The Aguara, or Azara's Fox (*Canis Azaræ*), another South American species, is almost half-way between Jackals and Foxes, the latter of which it chiefly resembles in its long tail and short snout.

THE COMMON FOX.*

The Foxes form a very distinct group of *Canidæ,* differing far more from the Dog, Wolf, and Jackal than those animals do from one another. The most characteristic and important difference between them lies in the fact that in the Foxes the pupil of the eye contracts under the influence of strong light to a vertical slit, dilating and becoming circular again as the light diminishes. This is the case, as will be remembered, in the Common Cat, and many other members of the same family; it is, in fact, very usual in animals of nocturnal habits, which, being used under ordinary circumstances to make shift with the smallest quantity of light obtainable, are advantaged by being able to exclude all superfluous rays when the illumination becomes stronger than they can comfortably bear. Moreover, the muzzle of Foxes is much sharper than that of Dogs, the head more rounded, the ears erect and triangular, the limbs short, and the tail or "brush" long, thick, and bushy. On account of these differences, many naturalists prefer to separate the Foxes altogether from Dogs, Wolves, and Jackals, and make them constitute a new genus—*Vulpes*—the Common Fox being called *Vulpes vulgaris.*

COMMON FOX.

The habits and appearance of the Fox are thoroughly well known, especially in Great Britain, where the life of this, the greatest marauder of the farmyard, is held in such high esteem, that in many places vulpicide is a crime of almost equal magnitude with homicide, and of far greater magnitude than uxoricide: at any rate, if the latter operation be only fairly conducted, *secundum artem,* with boots. In many counties, even now, the farmer who kills the pillager of his poultry-yard, instead of leaving him to come by his death in the hunting-field, is promptly "sent to Coventry," and often obliged to pack up, bag and baggage, and try his fortune in another locality. The Fox, indeed, must be brought to justice for no crime he may commit, however great; but when his time is up, he must be hunted to death with an army of Dogs, each one twice his own size, and his dying struggles witnessed by scores of horsemen and horsewomen, who are considered to have done great things if they are "in at the death" of the insignificant little thing, which ought to have been knocked on the head long ago.

The cunning of the Fox is proverbial. When hunted, he "makes a thousand shifts to get away," and often succeeds in baffling the whole pack of well-trained Hounds. His stealthy tread, as he winds along the hill sides and valley slopes to seek his prey or to reach his lair, is altogether characteristic of one thoroughly well up to his work. Numberless tales are told of his sagacity, but we will content ourselves with one which forms almost as good an example of animal reason as any we have met with, even in the Dog:—

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* *Canis vulpes.*

"A farmer in Bogside, Beith, of the name of Fleming, was looking out of his window one summer's morning, about three o'clock, when he saw a Fox crossing a field before it, carrying a large Duck which he had captured. On coming to a stone dyke, about four feet high, on the side of the field, Reynard made an effort to leap over it with his prey, but failed, and fell back into the field. After making three attempts, with the same result, he sat down, and viewed the dyke for a few minutes; after apparently satisfying himself, he caught the Duck by the head, and standing up against the dyke with his fore-paws as high as he could reach, he placed the bill of the Duck in a crevice in the wall; then springing upon the top he reached down, and pulling up the Duck, dropped it upon the other side, leaped down, and picking it up, went on his way."

The Common Fox is found, under more or less well-marked varieties, some of which are often elevated to the rank of species, over the greater part of Europe, Asia, and North Africa, and in many parts of America.

THE ARCTIC FOX.*

This is an extremely well-marked species of Fox, found in the southern and central parts of Greenland, and extending high up Smith's Sound. It is sometimes seen during the Seal-hunting season hundreds of miles from land, on the frozen sea, where it has wandered to feast on the dead Seals.

It is usually stated that the colour of the skin of this animal varies with the season—that in summer it is of a blue-grey colour, while in winter it is perfectly white; these colours, of course, serving as a protection to the animal: the blue harmonises well with the rocky shore and the thick, dark ice, while the winter coat is perfectly indistinguishable on the snow, with which the ground is then thickly strewn. But according to a writer of high authority, Dr. Robert Brown, this is all a mistake. The white and blue colours are distinctive of separate varieties of the Arctic Fox, and not of the same animal at different seasons; the colour in each case being wholly independent of the time of year. The length, from snout to root of tail, is about two feet, that of the tail itself about a foot.

An interesting account of the manners and customs of this pretty little animal is given by Sir J. Richardson, who says:—

"The Arctic Fox is an extremely cleanly animal, being very careful not to dirt those places in which he eats or sleeps. No unpleasant smell is to be perceived, even in a male, which is a remarkable circumstance. To come unawares on one of these creatures is, in my opinion, impossible; for even when in an apparently sound sleep, they open their eyes at the slightest noise which is made near them, although they pay no attention to sounds when at a short distance. The general time of rest is during the daylight, in which they appear listless and inactive; but the night no sooner sets in than all their faculties are awakened: they commence their gambols, and continue in unceasing and rapid motion until the morning. While hunting for food, they are mute, but when in captivity or irritated, they utter a short growl, like that of a young puppy. It is a singular fact that their bark is so undulated as to give an idea that the animal is at a distance, although at the very moment he lies at your feet. Although the rage of a newly-caught Fox is quite ungovernable, yet it very rarely happened that on two being put together they quarrelled. A confinement of a few hours often sufficed to quiet these creatures; and some instances occurred of their being perfectly tame, although timid, from the first moment of their captivity. On the other hand, there were some which, after months of coaxing, never became more tractable. These, we supposed, were old ones.

"Their first impulse on receiving food is to hide it as soon as possible, even though suffering from hunger, and having no fellow-prisoners of whose honesty they are doubtful. In this case, snow is of great assistance, as being easily piled over their stores, and then forcibly pressed down by the nose. I frequently observed my Dog-Fox, when no snow was attainable, gather his chain into his mouth, and in that manner carefully coil it so as to hide the meat. On moving away, satisfied with his operations, he of course had drawn it after him again, and sometimes with great patience repeated his labours five or six times, until in a passion he has been constrained to eat his food without its having been rendered luscious by previous concealment. Snow is the substitute for water to these creatures, and on a large lump being given to them, they break it in pieces with their feet, and roll on it with great delight. When the snow was slightly scattered on the decks, they did not lick it up, as Dogs are accustomed to do, but by repeatedly pressing with their nose collected small lumps at its extremity, and then drew it into the mouth with the assistance of the tongue." In another passage, Captain Lyon, alluding to the above-mentioned Dog-Fox, says, "He was small and not perfectly white; but his tameness was so remarkable, that I could not afford to kill him, but confined him on deck in a small hutch with a scope of chain. The little animal astonished us very much by his extraordinary sagacity: for, during the first day, finding himself much tormented by being drawn out repeatedly by his chain, he at length, whenever he retreated to his hut, took this carefully up in his mouth, and drew it so completely after him that no one who valued his fingers would endeavour to take hold of the end attached to the staple."

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* *Canis lagopus.*

The Eskimo take the Arctic Foxes in traps, which are described by Captain Parry as being "extremely simple and ingenious. They consist of a small circular arched hut, built of stones, having a square aperture at the top, but quite close and secure in every other part. This aperture is closed by some blades of whalebone, which, though in reality only fixed to the stones at one end, appear to form a secure footing, especially when the deception is assisted by a little snow laid on them. The bait is so placed that the animal must come upon this platform to get at it, when the latter, unable to bear the weight, bends downwards, and after precipitating the Fox into the trap, which is made too deep to allow of his escape, returns by its elasticity to its former position, so that several may then be caught successively." They are also taken in the wolf-traps of ice; and all the rocky islands lying off the mouth of the Coppermine River are studded with square traps, built of stone, by the Eskimo, wherein the Fox is killed by a flat stone falling upon him when he pulls at the bait.

The skins of both the white and the blue Fox are important articles of commerce, but the blue variety, being much rarer than the white, is far more valuable, the price for it being six or seven times as much as that of the white.

THE FENNEC.*

This is a pretty little Fox-like animal, about ten inches long, not including the tail, which measures about five inches and a quarter. The fur is of a whitish hue, the cheeks large, and the snout sharp, just like those of a true Fox; but the ears distinguish it at once: they are quite erect, and nearly three inches and a half long, that is, considerably longer than the whole head.

The Fennec is found in the whole of Africa, and has also been described as occurring at Bushire, on the shores of the Persian Gulf. It was first noticed by the African traveller, Bruce, who kept a specimen as a pet. The favourite food of this animal "consisted of dates or any sweet fruit; but he was also very fond of eggs. He would eat bread when hungry, more especially if it was rendered palatable by honey or sugar. The sight of a bird aroused him to eager watchfulness as long as it was present; and a Cat was his aversion. He would endeavour to hide from the latter, but never showed a disposition to resist or defend himself. The animal was disposed to sleep by day, but as night came on he became restless to excess. Bruce never heard it utter any sound. He says that the animal is described in many Arabian books under the name of El Fennec, by which appellation he states that it is known all over Africa; and he conceives that the word is derived from the Greek *Phoinix*, a palm or date-tree, adding that the animal builds his nest on trees, and does not burrow in the earth."

The fondness of the Fennec for vegetable food is curious, as most of the wild *Canidæ* have so marked a preference for animal food. Bruce's statement quite bears out the main fact in the old fable of "The Fox and the Grapes," as well as that in the "Song of Songs"—"Take us the Foxes, the little Foxes, that spoil the vines: for our vines have tender grapes."

On the shores of the Persian Gulf, the Fennec is sometimes hunted with Dogs, and will often take to the sea to escape from its enemies. Fennec-hunting is likely to be good sport, as the long-eared little creature is extremely plucky and enduring. In Africa, according to Sir John Kirk, "these animals hunt in packs. Although inferior in speed to the Antelope, they will run him down, and at last wear him out; even the Buffalo they are said sometimes to kill."

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* *Canis zerda.*

FENNECS AND JERBOAS.

THE LONG-EARED FOX.[*]

This very extraordinary little animal is found only in South Africa. It has somewhat the appearance of a Fennec, but the bushy tail is straight and comparatively short, being not more than half the length of the body and head, which together are about two feet long. The ears are of great size, and the snout is very short and pointed. The skin is of a greyish-yellow colour, white beneath, and the tail is darker than the rest of the body. It differs from all other Canidæ in having no less than six additional molar teeth, two on each side of the upper, one on each side of the lower jaw.[†] Some of the teeth, too, show an approximation in form to those of the Civets. For these reasons it is, like the two following animals, placed in a separate genus from the rest of the Canidæ.

THE RACOON DOG.[‡]

This is another member of the family, the peculiarities of which are so great as to necessitate its being placed in a separate genus. It is very different from an ordinary Dog, and has the look of a Racoon, which, as we shall see afterwards, is a member of one of the families of Arctoidea, and far removed from the Dogs. The body is covered with long brown fur; the ears are short and rounded. The back is curiously arched, almost like that of a Marten or Weasel; the legs are short and slender. The body attains a length of almost twenty-eight inches; the prettily-feathered tail is about four inches in length. The teeth equal in number those of ordinary Dogs.

THE HYÆNA-DOG.[§]

This curious animal, sometimes called the "Cape Hunting Dog," is found over the greater part of trans-Saharal Africa, being especially abundant in the neighbourhood of Cape Colony. Of all the Cynoids it is the species which shows the greatest approximation to the Æluroid type. It is, to all intents and purposes, a Dog, but yet in some few respects shows a decided relationship with the Hyænas; for instance, the back slopes slightly towards the hinder quarter, the muzzle is black, and of that ugly snub-nosed character so characteristic of Hyænas, the ears are long and straight, and the tail scanty. It differs also from the true Dogs in having only four toes on all the feet, instead of five on the fore feet and four on the hind feet. The skull and teeth are quite Cynoid in character: the former presenting only one single slight and unimportant point in which it tends to resemble that of a Hyæna.

The Lycaon is about the size of a Wolf. Its skin varies a good deal in its markings. "White, black, and yellow ochre are its chief tints; the white predominates in some, the black in others, and forms the fundamental colours; the spots are very irregular, sometimes large, sometimes small, very varyingly disposed on the surface of the body; the white and ochreous spots are always mixed with black. The colouration of the head is the most constant; the muzzle is black up to the eyes; and black bands are prolonged between the eye and ear, along the top of the head, to the neck. The tail is usually tolerably regular in colouration: it is ochreous at the root, black in the middle, white or ochreous at the tip; the eyes are brown."

The Hyæna-Dogs are partly diurnal, partly nocturnal in their habits. They like fresh meat, and are, at the same time, partial to carrion.

"These animals invariably hunt together in large organised packs, varying in numbers from ten to sixty, and by their extraordinary powers of endurance and mode of mutual assistance, they are enabled to run into the swiftest and overcome the largest and most powerful Antelope. Their pace is a long, never-tiring gallop, and in the chase they relieve one another, the leading Hounds falling to the rear when fatigued, when others who have been husbanding their strength come up and relieve them. Having succeeded in bringing their quarry to bay, they all surround him, and he is immediately dragged to the ground, and in a few minutes torn to pieces and consumed.

"Their voices consist of three different kinds of cry, each being used on special occasions. One of their cries is a sharp angry bark, usually uttered when they suddenly behold an object which they cannot make out. Another resembles a number of Monkeys chattering together, or con-

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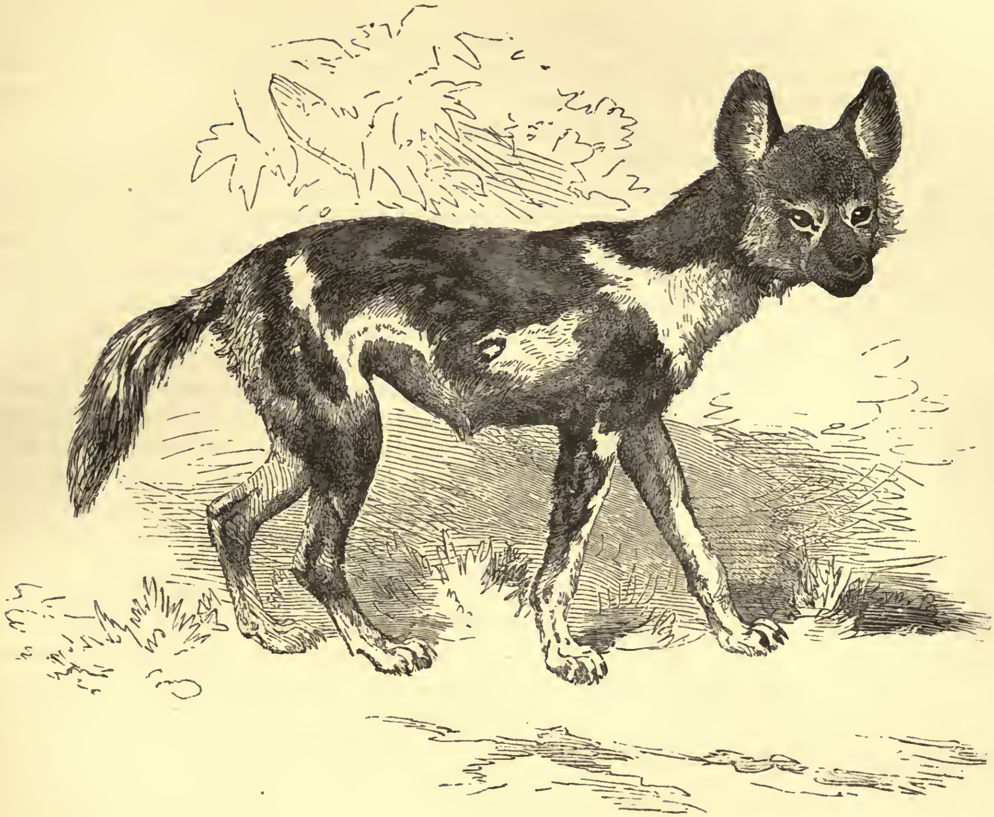
[*] *Megalotis Lalandii.*

[†] The dental formula is, therefore, incisors, $\frac{3-3}{3-3}$; canines, $\frac{1-1}{1-1}$; premolars, $\frac{4-4}{4-4}$; molars, $\frac{4-4}{4\ \ 4}$=48.

[‡] *Nycterentes procyonides.*

[§] *Lycaon pictus.*



HYÆNA DOG.

versing when their teeth are chattering violently from cold. This cry is emitted at night, when large numbers of them are together and they are excited by any particular occurrence, such as being barked at by Domestic Dogs. The third cry, and the one most commonly uttered by them, is a sort of rallying note to bring the various members of the pack together when they have been scattered in following several individuals of a troop of Antelopes. It is a peculiarly soft and melodious cry, yet, nevertheless, may be distinguished at a great distance. It very much resembles the second note uttered by the Cuckoo, which visits our island during the summer months; and when heard on a calm morning echoing through the distant woodlands, it has a very pleasing effect." *

CHAPTER X.

THE BEAR FAMILY.—THE BEARS.

Characters of the URSIDÆ—Their Mode of Progression—Teeth—Skull—Geographical Distribution—THE BROWN BEAR—Its Occurrence—Character—Habit of Hibernating—Diet—Moral Characteristics—Bear-baiting—Varieties—THE AMERICAN BLACK BEAR—Its Habits—Superstitions of the Indians regarding it—THE GRIZZLY BEAR—THE SYRIAN BEAR—THE HIMALAYAN BEAR—THE SUN BEAR—THE SLOTH BEAR—Its Ant-and Bee-eating Propensities—THE SPECTACLED BEAR—THE POLAR BEAR—Its Size—Characteristics—Habits—Method of Hunting—The supposed Poisonous Properties of its Liver.

THE BEAR FAMILY.†

WE now come to the last group of Carnivora—that of the Arctoidea—and to a family which forms an extreme limit to the long series, of which the Dogs constitute the centre, and the Cats the opposite end.

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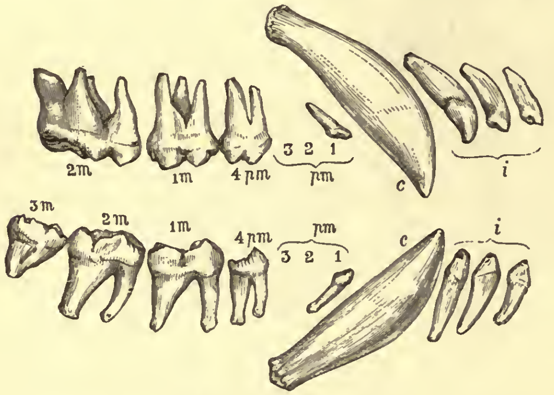
* Gordon Cumming, quoted by A. Murray: "Geographical Distribution of Mammals."

† *Ursidæ.*

The latter, as we have already seen, culminate in one direction—that is, they attain the perfection of structure for a predatory life and flesh diet. The members of the Dog family, again, are flesh-eaters, as a rule, but not exclusively. They are well adapted for hunting and catching living prey, but by no means so perfectly as the Cats; they are, indeed—from a carnivorous point of view—the inferiors of the Feline group in teeth, in claws, and in muscular strength and agility.

The Bears, with which we have now to do, depart as widely from the Dogs in one direction as the Cats in the other; and their distance from the latter family is great indeed. The Cats attain the perfection of quadrupedal form, while few animals are more clumsy and awkward-looking than a Sloth Bear. Cats walk, with an elegant and silent tread, on the very tips of their toes; Bears shuffle along with a waddling, though often rapid gait, and with the whole sole of both fore and hind feet applied to the ground, or, in other words, are wholly plantigrade. Cats have a clean-cut, rounded face, with beautifully chiselled nostrils and thin lips; Bears a long snout, almost like a Pig's. The fur of Cats is usually short and brilliantly coloured; that of Bears long, shaggy, and sombre. Lastly, while the Cats are almost exclusively flesh-eaters, many Bears are strict vegetarians, or at most eat such matters as Ants and honey, and only have recourse to meat when their favourite food cannot be had.

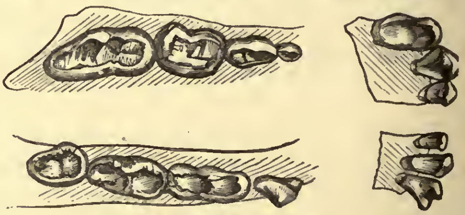


TEETH OF POLAR BEAR.

i, incisors; *c*, canines; *pm*, premolars (the second and third of which are absent in both jaws); *m*, molars.

In correspondence with the partly or entirely vegetable nature of the Bear's diet, we find a remarkable series of modifications in its teeth. The front teeth, or incisors, are of considerable size, and have three points or cusps. The great eye-teeth, or canines, although large and formidable, are decidedly smaller in relation to the rest of the teeth than in either the Dog or Cat group. Following these are three very small teeth, which usually fall out at an early period, and are, therefore, not to be found in most skulls; these, as well as the next tooth, which is of considerable size, have their places occupied in the young Bear by "milk-molars," and are therefore called premolars. The last premolar in the upper jaw is succeeded by two, that in the lower jaw by three, true grinders or molars; so that the "dental formula" of the Bear is the same as that of the Dog, namely, incisors, $\frac{3-3}{3-3}$; canines, $\frac{1-1}{1-1}$; premolars, $\frac{4-4}{4-4}$; molars, $\frac{2-2}{3-3}$.

But though the number agrees, the form is very different. The incisors and canines, as we have said, exhibit no difference of importance, but the last premolar and all the molars, instead of having the sharp cutting character they have in the Cat, and to a less degree in the Dog, have comparatively flat crowns, raised up into a number of little elevations or tubercles; even the "carnassial" teeth (last premolar in the upper jaw, and first molar in the lower) have entirely lost their scissor-blade character, and become true grinders. As a corresponding change, the hinge of the lower jaw is no longer so constructed as to be incapable of any but an up and down motion; it can, on the contrary, be worked from side to side, so that the Bear can actually *chew* his food. The animal derives a double advantage from this: in the first place, the food can be reduced to a pulp, a very necessary thing for such food-materials as roots, which in an entire state would be highly indigestible; and, in the second place, it is acted upon for a considerable time by the saliva, and thus partially digested in the mouth, for one of the chief properties of saliva is to convert the insoluble, and therefore indigestible, starchy matter, of which a large part of most vegetable substances consists, into soluble, and therefore digestible, sugar.

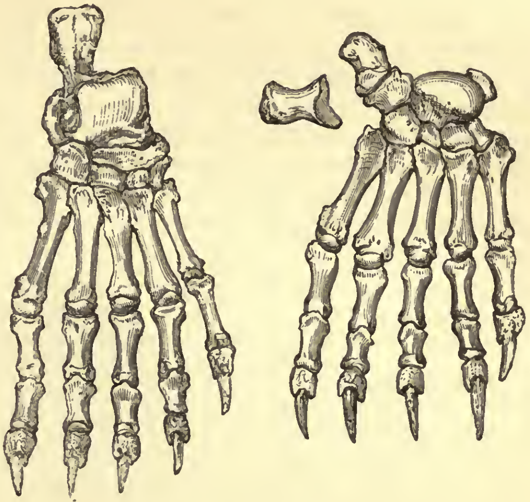


TEETH OF POLAR BEAR.

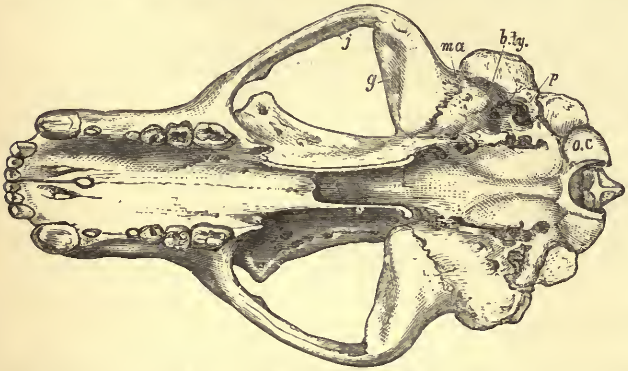
The incisors and grinding teeth only are shown, the grinding surfaces of the latter being displayed.

It is a remarkable circumstance that the teeth have the same form in all the Bears: though, as we shall see, while most of them are wholly or largely herbivorous, some, such as the Polar Bear, are almost entirely of flesh-eating habits, and one would naturally expect a difference in the teeth. Curiously enough, however, no such difference is apparent.

The Bears have five toes to each foot, all armed with long curved claws. In the skull the floor of the drum cavity of the ear is hardly at all dilated, so that there can scarcely be said to be a *bulla tympani* at all; moreover, a bony passage of considerable length leads from the drum to the exterior, instead of the aperture being flush with the wall of the drum, as in the Cats. As we have seen, the Cats have a small *cæcum*, or blind process, to the intestine, and the Dogs one of considerable size. In the Bear this appendage is wholly absent.


FEET OF BEAR.

Bears are found over a large part of the world, in Europe, Asia, North and South America, and North Africa. They are, however, wholly absent from what is termed trans-Saharal Africa, that is, the part of the continent south of the great Sahara Desert; and are also not to be found in any part of the Australian region, or, in other words, in Australia, Tasmania, New Zealand, and the islands of the Malayan Archipelago east of Wallace's line. They thus have a far more restricted distribution than either of the other two chief families of Carnivora—the *Felidæ* and *Canidæ*.



UNDER VIEW OF BEAR'S SKULL.

oc, occipital condyle; *p*, paroccipital process; *b.ty*, bulla tympani; *ma*, external auditory passage; *g*, glenoid cavity; *j*, jugular arch.

THE COMMON BROWN BEAR.*

The Brown Bear is the commonest member of the whole family, and has been known from very early periods. It was, indeed, for a long time the only species known to Linnæus, who recognised no other kind up to the tenth edition of his great work, when he doubtfully admitted the Polar Bear.

The Brown Bear is found in many parts of Europe—Norway, Russia, Central Europe, Spain, &c.—in Siberia, Kamtchatka, and Japan, and in a part of the Arctic regions of North America. In former times it was found in Britain, whence it was imported by the Romans, under the name of the Caledonian Bear, for the sports of the amphitheatre. "Ray quotes authority for the Brown Bear being one of the Welsh beasts of chase; and Pennant adduces the places which retained the name of Pennarth, or the Bear's Head, as evidence that it existed in that principality. In the 'History of the Gordons' it is stated that one of that family, so late as the year 1057, was directed by the king to carry three Bears' heads on his banner, as a reward for his valour in slaying a fierce Bear in Scotland." It is, however, quite possible that this valorous Gordon may be a mythical personage, or that he may have lived at a much earlier period than that to which his exploit is assigned.

The Brown Bear is an awkward-looking brute, with sprawling gait, heavy body, and no tail to speak of. It is about six feet long, and about three or three and a half feet high at the shoulder. Its fur is longish, rather woolly, and of a dark brown hue. It lives a solitary life, and, like many of its kin, has the curious habit of *hibernating.* During the summer, when food is abundant, it lays in a very large stock of provisions, thereby becoming immensely fat. This operation being satisfactorily performed by the beginning of winter, the Bear, finding that his foraging operations become more and more arduous, seeks out a resting-place, such as a hollow tree or a cavern, or if these are not to be had, makes a sort of rude hut or nest for himself of branches and moss, and then goes into winter quarters, and calmly settles down for a post-prandial slumber, which lasts until spring. He then emerges from his hiding-place, very thin and weak—altogether a mere ghost of his former self—and immediately sets about repairing his losses by as many hearty meals as he can possibly cram into the time at his disposal, or as the means at his command will allow.

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* *Ursus arctos.*

The Bear feeds chiefly on roots, berries, and other vegetables; it has also a fondness for Ants, and a perfect passion for honey, in the capture of which he is often severely stung about the nose—almost his only vulnerable part—by the infuriated inhabitants of the comb. He also preys upon small quadrupeds, and sometimes—especially when fully adult—on larger ones. He is occasionally bold enough to attack the Bull, but is, as often as not, worsted in the encounter. He rarely attacks man, unless provoked, and then, when his blood is up, is a most dangerous antagonist. His mode of attack is peculiarly his own. He does not fell his victim with a blow of his paw like one of the larger Cats, or seize it at once with his teeth like a Dog, but "gives it the hug"—embraces it tightly, and with a great show of affection, with its powerful fore limbs, and continues the squeeze until the wretched animal is suffocated. The female Bear, especially when her family is about, is a particularly ferocious creature. Her savageness is, indeed, proverbial; she is devoted to her cubs, and any one threatening their safety does so at his own peril.

COMMON BROWN BEAR.

The Bear is not only an affectionate mother, but is capable of a very firm friendship, as the following anecdote, related by Mr. Andersson,* shows. He tells us that, amongst a collection of animals he possessed "were two Brown Bears—twins—somewhat more than a year old, and playful as kittens when together. Indeed, no greater punishment could be inflicted upon these beasts than to disunite them, for however short a time. Still, there was a marked contrast in their dispositions: one of them was good-tempered and gentle as a lamb, while the other frequently exhibited signs of a sulky and treacherous character. Tempted by an offer for the purchase of the former of these animals, I consented, after much hesitation, to his being separated from his brother.

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* "Lake 'Ngami."

"It was long before I forgave myself this act. On the following day, on my proceeding, as usual, to inspect the collection, one of the keepers ran up to me, in the greatest haste, exclaiming, 'Sir, I am glad you are come, for your Bear has gone mad!' He then told me that during the night the beast had destroyed his den, and was found in the morning roaming wild about the garden. Luckily, the keeper managed to seize him just as he was escaping into the country, and, with the help of several others, succeeded in shutting him up again. The Bear, however, refused his food, and raved in so fearful a manner that, unless he could be quieted, it was clear he would do mischief.

"On my arrival at his den, I found the poor brute in a most furious state, tearing the wooden floor with his claws, and gnawing the barricaded front with his teeth. I had no sooner opened the door than he sprang furiously at me, and struck me repeated blows with his powerful paws. As, however, I had reared him from a cub, we had too often measured our strength together for me to fear him now; and I soon made him retreat into the corner of his prison, where he remained howling in the most heartrending manner. It was a most sickening sight to behold the poor creature, with his eyes bloodshot and protruding from the sockets, his mouth and chest white with foam, and his body crusted with dirt. I am not ashamed to confess that at one time I felt my own eyes moistened. Neither blows nor kind words were of any effect: they only served to irritate and infuriate him; and I saw clearly that the only remedy would be either to shoot him or to restore him to his brother's companionship. I chose the latter alternative; and the purchaser of the other Bear, my kind friend, Sir Henry Hunloke, on being informed of the circumstance, consented to take this one also."

A more curious case is related by Brehm, who tells us of a little boy who crept one night for warmth and shelter into the cage of an extremely savage Bear. The latter, instead of devouring the child, took him under its protection, kept him warm with the heat of its body, and allowed him to return every night to its cage. The poor boy soon died of small-pox, and the Bear from henceforth refused all food, and soon followed its little *protégé* to the grave.

In former times, the Bear was in great requisition in England for the noble sport of Bear-baiting. Bear gardens existed in many parts of the metropolis, in which the unlucky animals were baited to death with Dogs, for the delectation of our most religious and gracious sovereign, good Queen Bess, and "his sowship," her successor. The office of keeper of the Bear Ward was considered quite an honourable post, and was usually held by one of "Her Majesty's Servants," the players—by such men, for instance, as Betterton and Alleyn the founder of Dulwich College. It has always been the custom, too, to train Bears to walk on their hind legs and dance. This they do much more easily than a Dog or a Cat, on account of their broad soles.

The Brown Bear, like most animals, differs more or less in minor characters according to the country in which it is found. The Bear of the Pyrenees and of Austria, for instance, is described as having, in the young condition, yellowish-white fur and black feet. Sir J. Richardson describes a well-marked variety as occurring in North America; this, which is quite distinct from the Grizzly and Black Bears, he calls the Barren-ground Bear.

THE AMERICAN BLACK BEAR.*

This animal is distinguished from the common Brown Bear, not only by its black fur, but by its slenderer snout, more convex forehead, and smaller size: it rarely exceeds five feet in length. Its habits are more strictly vegetarian than those of the brown kind. "Its favourite food appears to be berries of various kinds, but when these are not to be procured, it preys upon roots, insects, fish, eggs, and such birds or quadrupeds as it can surprise. It does not eat animal food from choice; for when it has abundance of its favourite vegetable diet, it will pass the carcass of a Deer without touching it."

It usually hibernates—at any rate, when able to obtain a sufficiently plentiful meal, or rather series of meals, before the commencement of winter. Sometimes, however, when food is scarce, Bears will roam about the whole winter, never being able to obtain a sufficiently good feed to warrant their going, with any safety or comfort, into permanent winter quarters. With regard to the hibernating Bears a very remarkable fact is mentioned by Sir J. Richardson, who is a most cautious and accurate writer, namely, that when the Bear "comes abroad in the spring it is equally fat" (as it was at the commencement of winter), "though in a few days thereafter it becomes very lean."

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* *Ursus americanus.*

The Indians have an unbounded reverence for the Bear. When they kill one, they make exculpatory speeches to it, give it tobacco to smoke, call it their relation, grandmother, &c., and try in every possible way to appease its *manes.* They then cook and eat it with great gusto.

GRIZZLY BEAR.

THE GRIZZLY BEAR.*

This animal, which inhabits the region of the Rocky Mountains as far south as Mexico, is the most savage member of the whole family, and is more dreaded by Indian and Canadian trappers than any other. It is stated to attain a length of nine feet and a weight of eight hundred pounds, so that it greatly exceeds the Brown and Black Bears in size, and approaches in these respects to the Polar Bear. Its strength is enormous. "It has been known to drag to a considerable distance the carcass of a Buffalo, weighing about one thousand pounds."

The fur is of a dark-brown colour, with a good deal of grey on the head, and is of an inferior quality to that of the brown and black kinds. It is also distinguished from the latter by shorter and more conical ears, by very long, arched, white claws, and by the ridiculously small size of its tail, which is completely hidden by the surrounding fur. "It is a standing joke among the Indian hunters, when they have killed a Grizzly Bear, to desire any one unacquainted with the animal to take hold of its tail."

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* *Ursus ferox.*

The Grizzly is much more carnivorous in its habits than other Bears, and its ferocity is so great that it will often attack man unprovoked. "The young Grizzly Bears and gravid females hibernate, but the older males often come abroad in the winter in quest of food."

ISABELLINE, OR INDIAN WHITE BEAR.

THE SYRIAN BEAR*

This animal, a fine specimen of which is in the Zoological Gardens, is the Bear of which we have the oldest historical record. It was an animal of this species that was slain by David during his shepherd's career; and two females of the same kind are stated to have attacked the mockers of Elisha, and to have killed forty-two of them.

The Syrian Bear is found in the mountains of Palestine, and especially in Lebanon; a variety, known as the Indian White Bear,† occurs in the Himalayas. It is of a yellowish-brown colour, but this hue varies somewhat according to sex and the season of the year. The claws are smaller than in any of the foregoing species, and, as in the Brown Bear, the diet is usually of a vegetable nature, recourse being had to animal food only in times of necessity.

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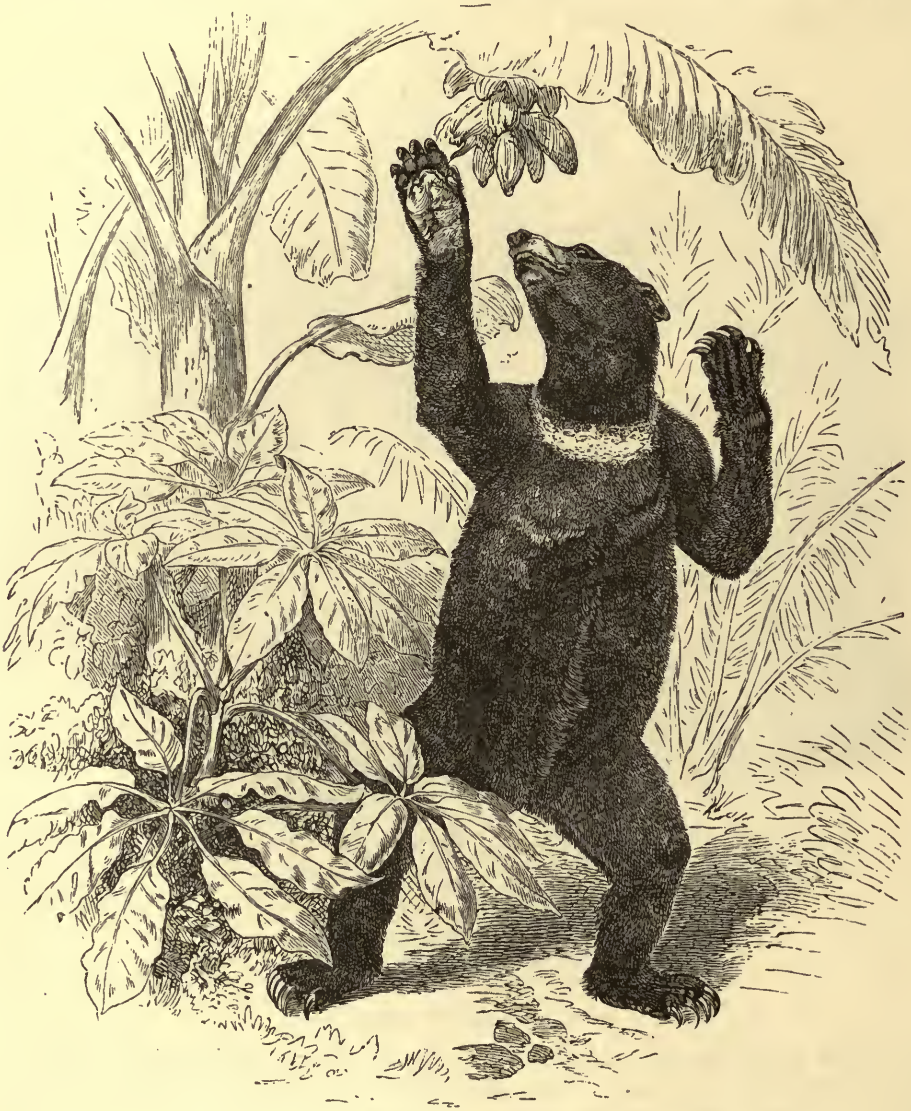
* *Ursus syriacus.* † *Ursus isabellinus.*

THE SUN BEARS.*

Under the name of "Sun Bear" are often included two very different species, the Himalayan Bear, Indian Black Bear, or Tibetan Sun Bear (*Ursus tibetanus*), and the Malayan Bear or Bruang (*U. malayanus*). The latter differs in certain comparatively unimportant respects from all the forms we have yet described, and is, therefore, sometimes separated as a distinct genus (*Helarctos*).



MALAYAN SUN BEAR.

The Himalayan Bear is found in Nepaul, Assam, Eastern Siberia, and China. It is about the size of the American Bear, and, like it, has close black fur, and a body and head more slender than those of the Brown or Syrian Bear. It is further distinguished by its white chin, by a broad white Y-shaped mark on the chest, and by a collar of longish hairs on the shoulders.

The Malayan Bear, called Bruang by the Malays, is found in the Malayan Peninsula, and in

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* *Ursus tibetanus* and *U.* (*Helarctos*) *malayanus.*

HIMALAYAN BEAR.

the adjacent islands of Borneo, Sumatra, and Java. It is much smaller than the Himalayan Bear, not exceeding four feet and a half in length. The fur is black, becoming brownish on the nose, and the chest is marked with a crescentic white mark, or, in the Bornean variety of the species, by a heart-shaped, orange-coloured patch. The claws are remarkably long.

The habits of the two species differ but little. In summer, according to Dr. Jerdon, the Sun Bear "is generally found at a considerable elevation, nine to twelve thousand feet or so, and often close to snow; but in winter it descends to five thousand feet, and even lower sometimes. It lives chiefly on fruits and roots, apricots, walnuts, apples, currants, &c.; also on several grains, barley, Indian corn, buckwheat, &c.; and in winter chiefly feeds on various acorns, climbing the oak trees and breaking down the branches. . . . They are very fond of honey. Now and then they will kill Sheep, Goats, &c., and are occasionally said to eat flesh. . . . This Bear has bad eyesight, but great power of smell, and if approached from windward is sure to take alarm. A wounded Bear will sometimes show fight, but in general it tries to escape. It is said sometimes to roll itself into the form of a ball, and then roll down steep hills, if frightened or wounded. If met suddenly, when there is no means of escape, it will attack man at once; and curious to say, it always makes for the face, sometimes taking off most of the hairy scalp, and frightfully disfiguring the unfortunate sufferer. There are few villages in the interior where one or more individuals thus mutilated are not to be met with."*

The Sun Bears are distinguished in menageries for their gift of walking about on their hind legs, which they do in a curiously human manner. This mode of progression seems sometimes to be adopted in the wild state. Both species are noticeable, in their state of captivity in the Zoological Gardens, for the antics they perform. The Himalayan Bears play with one another like two awkward boys, stand on their hind legs to wrestle, then fall down, and roll over and over, biting and hugging in the most laughable manner. The Malayan Bear is even more amusing. When the keeper gives it one of the hard biscuits on which it is fed, it will sometimes lie down on its back, and hold the biscuit now with its fore paws, now with both fore and hind paws, swaying about all the time, and expressing its satisfaction by the most comical noises.

Mr. Swinhoe quotes some curious notions entertained by the Chinese respecting the Sun Bear. They are contained in the native publication already referred to, *The Hainan Gazetteer.* "*Heirng* [or Bear] is fond of climbing trees and panting. Its gall in spring is in its heel, in summer in its belly, in autumn in its left paw, in winter in its right paw. About its heart there is a white fat, like jade, the taste of which is extremely fine: this is usually called 'Bear's white.' In winter the Bear lies torpid, and does not eat. When hungry, it licks its own paws, and thence the goodness in the paws."

THE SLOTH BEAR.†

This curious and ungainly-looking beast is another of the Indian Bears, being found "throughout India and Ceylon, from Cape Comorin to the Ganges." It is distinguished by its extremely awkward shape, its long shaggy hair, its prolonged and very flexible snout and lower lip, all of which peculiarities combine to give it a remarkable and anything but prepossessing appearance. The fur is mostly black, the muzzle and the tips of the feet being of a dirty white or yellowish colour, and the breast ornamented with a V-shaped or crescentic mark. It attains a length of between five and six feet.

The Sloth Bear feeds on Ants, honey, fruit, &c. "The power of suction in the Bear, as well as of propelling wind from its mouth, is very great. It is by this means enabled to procure its common food of white Ants and larvæ with ease. On arriving at an Ant-hill, the Bear scrapes away with the fore feet until he reaches the large combs at the bottom of the galleries. He then, with violent puffs, dissipates the dust and crumbled particles of the nest, and sucks out the inhabitants of the comb by such forcible inhalations as to be heard at two hundred yards' distance or more. Large larvæ are in this way sucked out from great depths under the soil. When Bears abound their vicinity may be readily known by numbers of these uprooted Ants' nests and excavations, in which the marks of their claws are plainly visible. They occasionally rob birds' nests, and devour the eggs."‡

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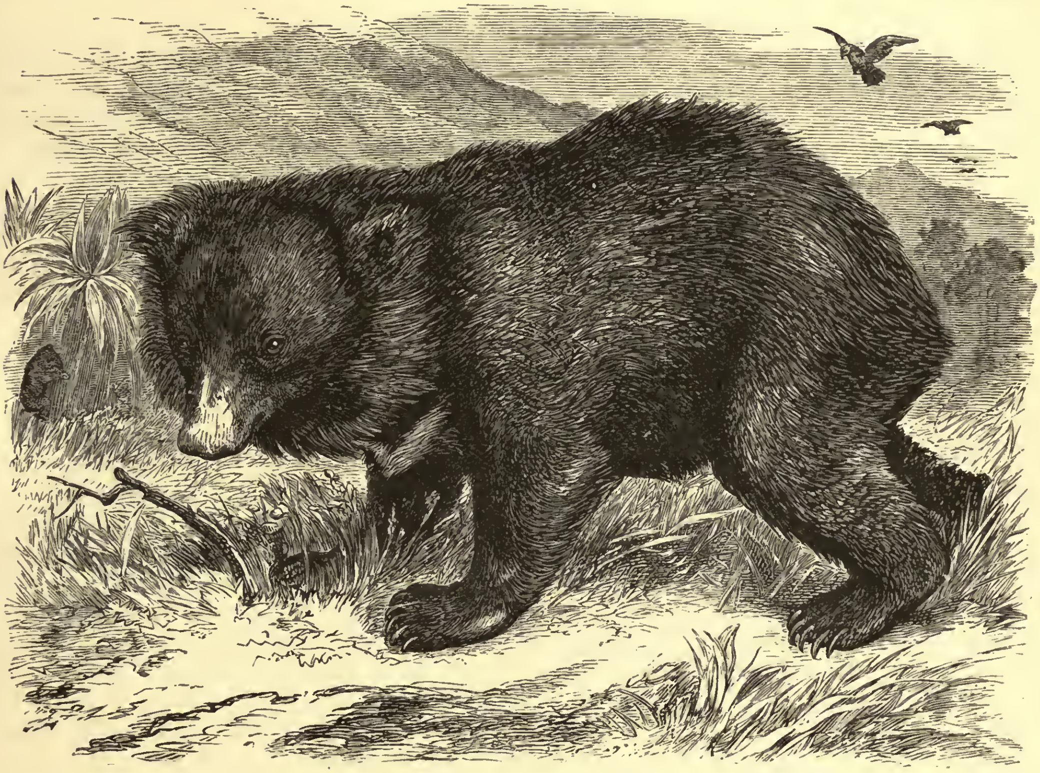
* Jerdon: "Mammals of India."

† *Ursus* (or *Melursus*) *labiatus.*

‡ Tickell, quoted by Jerdon.

The capture of Ants is, however, by no means always devoid of inconvenient consequences for the ursine ravisher. The insects are as brave and ferocious as they are industrious, and their strong sharp mandibles are capable of making a considerable impression upon the snout, lips, and eyelids of their huge enemy.

Like the Sun Bear, the Sloth Bear rarely attacks man unless provoked, but, like it, is, when attacked, a most dangerous antagonist, always making for the face, and especially the eyes. Both in Ceylon and in India the natives have a very wholesome dread of the animal, and, indeed, fear his onslaught more than that of any other beast. "Among the Singhalese there is a belief that certain charms are efficacious in protecting them from the violence of Bears, and those whose avocations expose them to encounters of this kind are accustomed to carry a talisman, either attached to their neck or enveloped in the folds of their luxuriant hair. A friend of mine, writing of an adventure which occurred at Anarajapoora, thus describes an occasion on which a Moorman, who attended him, was somewhat rudely disabused of his belief in the efficacy of charms upon Bears:—'Desiring to change the position of a herd of Deer, the Moorman (with his charm) was sent across some swampy land to disturb them. As he was proceeding, we saw him suddenly turn from an old tree and run back with all speed, his hair becoming unfastened, and, like his clothes, streaming in the wind. It soon became evident that he was flying from a terrific object, for he had thrown down his gun, and, in his panic, he was taking the shortest line towards us, which lay across a swamp covered with sedge and rushes, that greatly impeded his progress, and prevented us approaching him or seeing what was the cause of his flight. Missing his steps from one hard spot to another, he repeatedly fell into the water, but he rose and resumed his flight. I advanced as far as the sods would bear my weight, but to go further was impracticable. Just within ball range there was an open space, and as the man gained it, I saw that he was pursued by a Bear and two cubs. As the person of the fugitive covered the Bear, it was impossible to fire



SLOTH BEAR.

without risk. At last he fell exhausted, and the Bear being close upon him, I discharged both barrels. The first broke the Bear's shoulder; but this only made her more savage, and rising on her hind legs, she advanced with ferocious growls, when the second barrel—though I do not think it took effect—served to frighten her, for turning round she retreated, followed by her cubs. Some natives then waded through the mud to the Moorman, who was just exhausted, and would have been drowned but that he fell with his head upon a tuft of grass. The poor man was unable to speak, and for several weeks his intellect seemed confused. The adventure sufficed to satisfy him that he could not again depend upon a charm to protect him from Bears, though he always insisted that but for its having fallen from his hair, where he had fastened it under his turban, the Bear would not have ventured to attack him.'"*

THE SPECTACLED BEAR.†

One of the most comical and grotesque of all the Bear family is the Spectacled Bear, which derives its chief attraction from the light-coloured rings round its eyes; these—the greater part of the face being, like the body, black—have exactly the appearance of a pair of common "goggles," through which the beast seems to look with an air of mingled wisdom and imbecility. Hence, of course, we get the animal's English popular name.

The Spectacled Bear occurs only in South America, where it is found in the mountainous regions of Chili. It attains a length of about three feet and a half.

THE POLAR BEAR.‡

The great White Bear of the Arctic regions—the "Nennok" of the Eskimo—is the largest as well as one of the best known of the whole family. It is a gigantic animal, often attaining a length of nearly nine feet, and is proportionally strong and fierce. It is found over the whole of Greenland; but its numbers seem to be on the decrease. It is distinguished from other Bears by its narrow head, its flat forehead in a line with the prolonged muzzle, its short ears, and long neck. "It is of a light creamy colour, rarely pure white, except when young: hence the Scottish whalers call it the 'brounie,' or 'brownie,' and sometimes 'the farmer,' from its very agricultural appearance as it stalks leisurely over the furrowed fields of ice. Its principal food consists of Seals, which it persecutes most indefatigably; but it is somewhat omnivorous in its diet, and will often clear an islet of Eider-duck eggs in the course of a few hours. I have seen it watch a Seal for half a day, the Seal continually escaping, just as the Bear was about putting its foot on it, at the *atluk* (or escape hole) in the ice. Finally, it tried to circumvent its prey in another manner. It swam off to a distance, and when the Seal was again half asleep at its *atluk*, the Bear swam under the ice, with a view to cut off its retreat. It failed, however, and the Seal finally escaped. The rage of the animal was boundless; it roared hideously, tossing the snow in the air, and trotted off in a most indignant state of mind."§

Being so fond of Seal-flesh, the Polar Bear often proves a great nuisance to Seal-hunters, whose occupation he naturally regards as a thoughtful catering for his wants. He is also glad of the Whale carcases often found floating in the Arctic seas; and travellers have seen as many as twenty Bears busily discussing the huge body of a dead Whalebone Whale.

As the Polar Bear is able to obtain food all through the Arctic winter, there is not the same necessity, as in the case of the vegetable-eating Bears, for hibernating. In fact, the males and young females roam about through the whole winter, and only the pregnant females retire for the season. These—according to the Eskimo account, quoted by Captain Lyon—are very fat at the commencement of winter, and on the first fall of snow they lie down and allow themselves to be covered, or else dig a cave in a drift, and then go to sleep until the spring, when the cubs are born. By this time the animal's heat has melted the snow for a considerable distance, so that there is plenty of room for the young ones, who tumble about at their ease, and get fat at the expense of their parent, who, after her long abstinence, becomes gradually very thin and weak. The whole family leave their abode of snow when the sun is strong enough to partially melt its roof. The Eskimo have the same theory about the hibernating Polar Bears that the Northern Indians hold with regard to the Brown Bear, namely, that it has no evacuations during the winter, "stopping up all the natural passages with moss, grass, or earth."

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* Tennent: "Ceylon."

† *Ursus* (or *Helarctos*) *ornatus*.

‡ *Ursus* (or *Thalassarctos*) *maritimus*.

§ R. Brown, quoted from "Arctic Manual."

The Polar Bear is regularly hunted with Dogs by the Eskimo. The following extract gives an account of their mode of procedure :—"Let us suppose a Bear scented out at the base of an iceberg. The Eskimo examines the track with sagacious care, to determine its age and direction, and the speed with which the animal was moving when he passed along. The Dogs are set upon the trail, and the hunter courses over the ice at their side in silence. As he turns the angle of the berg his game is in view before him, stalking, probably, along with quiet march, sometimes snuffing the air suspiciously, but making, nevertheless, for a nest of broken hummocks. The Dogs spring forward, opening a wild, wolfish yell, the driver shrieking 'Nannook! nannook!' and all straining every nerve in pursuit.

POLAR BEARS.

"The Bear rises on his haunches, inspects his pursuers, and starts off at full speed. The hunter, as he runs, leaning over his sledge, seizes the traces of a couple of his Dogs, and liberates them from their burthen. It is the work of a minute, for the motion is not checked, and the remaining Dogs rush on with apparent ease.

"Now, pressed more severely, the Bear makes for an iceberg, and stands at bay, while his two foremost pursuers halt at a short distance and await the arrival of the hunter. At this moment the whole pack are liberated; the hunter grasps his lance, and, tumbling through the snow and ice, prepares for the encounter.

"If there be two hunters, the Bear is killed easily; for one makes a feint of thrusting the spear at the right side, and, as the animal turns with his arms towards the threatened attack, the left is unprotected and receives the death-wound.

"But if there be only one hunter, he does not hesitate. Grasping the lance firmly in his hands, he provokes the animal to pursue him by moving rapidly across its path, and then running as if to escape. But hardly is its long unwieldy body extended for the solicited chase, before, with a rapid jump, the hunter doubles on his track and runs back toward his first position. The Bear is in the act of turning after him again, when the lance is plunged into the left side, below the shoulder. So dexterously has this thrust to be made, that an unpractised hunter has often to leave his spear in the side of his prey and run for his life. But even then, if well aided by the Dogs, a cool skilful man seldom fails to kill his adversary." *

With regard to the value of the skins, Dr. R. Brown informs us that "The Royal Board of Trade in Greenland give the natives about five rigsdaler (11s. 3d.) for a skin. Occasionally, there are a number killed near Cape Farewell, which have come round on the Spitzbergen ice-stream. Here a curious custom prevails, viz., that whoever sights the Bear first—man, woman, or child—is entitled to the skin, and the person who has shot it only to the blubber and flesh."

There are some dreadful tales prevalent as to the ferocity of the Polar Bear; but these, according to the same excellent observer, approach a good deal the nature of "yarns." After having lived for some time in the Arctic regions, and hunted Bears again and again, he considers that "a great deal of the impressions which we have imbibed regarding its ferocity are more due to old notions of *what it ought to be* rather than *what it is*, and that the tales related by Barentz, Edward Pelham, and other old navigators, regarding its bloodthirstiness during the time they wintered in Spitzbergen, were a good deal exaggerated. When enraged, or emboldened by hunger, I can, however, quite well understand that, like all wild and even domesticated animals, it may be dangerous to man. On the East Coast of Greenland, where they know little of man, they are very bold. The members of the German Expedition, when making out-door observations, had to be continually on their guard against them. I have chased it over the floes of Pond's Bay, and the Bear's only thought seemed to be how best to escape from its pursuers. I should have hesitated a good deal before making so free with the Grizzly Bear of the Californian wilds (*Ursus ferox*), which is, perhaps, the most ferocious animal on the American continent. Though seemingly so unwieldy, the *nennok* runs with great speed, and being almost marine in its habits, it swims well. I have chased it with a picked crew of eight whalemen, and yet the Bear has managed to distance us in the race for the ice-fields. It would every now and again, when its two cubs were getting left in the rear, stop and (literally) push them up behind; and on reaching the steep edge of the ice-floe, finding that we were fast reaching them, it lifted each of them upon the ice with its teeth, seizing the loose skin at the back of the neck. Once on the ice, they were safe.

"Unlike its congeners, it does not *hug*, but *bites;* and it will not eat its prey until it is dead, playing with it like a Cat with a Mouse. I have known several men who, while sitting watching or skinning Seals, have had its rough hand laid on their shoulder. Their only chance then has been to feign being dead, and manage to shoot it while the Bear was sitting at a distance watching its intended victim. Though Eskimo are often seen who have been scarred by it, yet I repeat that, unless attacked or rendered fierce by hunger, it rarely attacks man. During our last trip to Greenland, none of our party saw one; indeed, they are only killed in the vicinity of Disco Bay, during the winter or spring, when they have either come or drifted south on the ice-floes. Six were killed in the vicinity of Omenak during the winter of 1866–67."

The flesh of the Polar Bear is sometimes eaten by the Eskimo, but parts of it are said to be poisonous; this is especially the case with the liver. Scoresby relates that sailors who have incautiously partaken of the latter have been made very ill, and have died from its effects; and Kane, who wished to try for himself the truth of the statement, was upset by the first taste. The fat of this Bear is used for burning; it has not the disagreeable smell of train-oil.

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* Quoted by Jesse: "History of the British Dog."

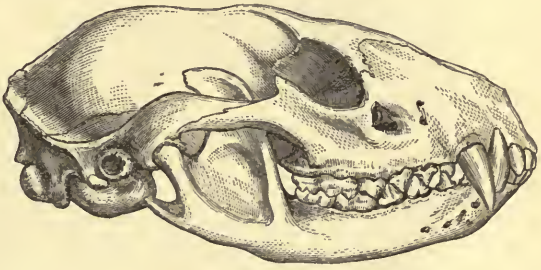
CHAPTER XI.

RACOON FAMILY—PANDA FAMILY—WEASEL FAMILY—FOSSIL CARNIVORA.

The Racoon Family—Characters of their Skull, Teeth, &c.—Geographical Distribution—The Racoon—Its Habit of Washing its Food—Its External Characters and Habits—Racoon Hunting—The Crab-eating Racoon—The Coati—The Kinkajou—Its Lemur-like Appearance, Prehensile Tail, &c.—The Cacomixle—The Panda Family—The Panda—Its Character and Habits—The Ailuropus—The Weasel Family—Anatomical Characters—Tail-glands—Division of the Family into Three Sub-families—Importance of the Mustelidæ as Fur-producing Animals—The Glutton—Its Characters—Superstitions Regarding it—Its Cunning—The Marten—The Pekan—The Sable—The Weasel—The Stoat, or Ermine—The Difference between its Winter and Summer Dress, and the manner in which the Change takes place—The Polecat —The Ferret—The Mink—The Grison—The Tayra—The Ratel—The Common Badger—Its Habits—Burrowing — The American Badger — The Teledu—The Cape Zorilla—The Common Skunk — Its Noxious Secretion — Hydrophobia produced by Skunk Bite—The Little Striped Skunk—The White-backed Skunk—The Common Otter—The Adaptation of its Structure to Aquatic Life—Use of Tame Otters for Fishing—The Canadian Otter—The Margined-tailed Otter—The Sea Otter—Its Affinities with the Seals—How it is Hunted—General Relations of the Land Carnivora—Fossil Carnivora—The Tendency of these to bridge over Existing Groups—Appendix to Chapter VI. (Civet Family)—The Cynogale—The Cynictis—The Mangue—The Suricate.

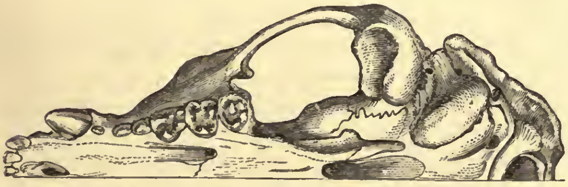
THE RACOON FAMILY.*

This is a small family of curious Bear-like animals, of small size, and differing a good deal in external appearance, although agreeing closely in all essential particulars. They are plantigrade, like the Bears, and like them are quite devoid of a blind-gut, or cæcum. The skull is long-snouted, and though presenting certain resemblances to that of the Civets, has still the essential Arctoid characters, such as the well-marked bony ear-passage, and the wide space between the ear-drum bone and the bony projection on the hinder part of the skull (paroccipital process). A great difference from the Bear's skull, is, however, seen in the swollen and bulb-like ear-drum bone (bulla tympani), which is as large as that of a Dog.



SKULL OF RACOON.

The grinding-teeth have on their biting surfaces large and prominent tubercles, so that they are neither altogether of a crushing, nor altogether of a mincing character. The molars bear a considerable resemblance to the hinder molars of the Dog; the canines are compressed from side to side, have very sharp front and back edges, and are somewhat outstanding. The number of the teeth is forty,† that is, two less than in the Bears, the missing teeth being the last upper molar of each side.



HALF OF SKULL OF RACOON, UNDER VIEW.

The four genera of the Racoon family are found only in the New World; their northern limit is British Columbia, while southwards they reach to Paraguay in the central part of South America.

THE RACOON.‡

Every visitor to the Zoological Gardens must have been struck with the curious habits of this animal. If any one gives it a bit of bun or biscuit, the Racoon holds out both its hands for the morsel, and takes it almost as deftly as a Monkey; it then waddles off to the little pond in the middle of its cage, dips its prize in the water, and when it is well soaked, proceeds to devour it. Except in the case of meat, which the Racoon seems to consider moist enough, the food always has to undergo this soaking process before it is thought to be fit to eat. It is from this habit that the

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* *Procyonidæ*. † The dental formula is—Incisors, $\frac{3-3}{3-3}$; canines, $\frac{1-1}{1-1}$; premolars, $\frac{4-4}{4-4}$; molars, $\frac{2-2}{2-2}=40$. ‡ *Procyon lotor*.

Racoon derives its specific name of *lotor*, "the washer," and its German appellation of *Waschbär*, or "washing Bear."

The Racoon is a decidedly handsome animal, about the size of a large and very corpulent Cat. The hair is of a brown or grizzled colour, long and furry, the tail bushy and beautifully ringed. Its body is large and somewhat unwieldy, its legs short, and its feet armed with strong claws, suitable for burrowing or climbing. The head is large, the cheeks prominent and black, and the snout sharp, light-coloured, and somewhat up-turned—"tip-tilted, like the petal of a flower"—giving the animal a curious inquisitive look, which is quite borne out by its character. It investigates every object within reach, animate or inanimate; the latter, if portable, it is fond of carrying off and carefully washing.

In the matter of diet it is omnivorous, and seems almost equally fond of meat, insects, fruit, or bread. It is said also to catch and eat oysters and crabs, and to confine itself, in the case of the birds it catches, to the brain and blood. It is a decidedly cunning animal, and in captivity, when allowed a certain amount of liberty, shows great talent in stealing fruit and killing fowls. When eating, it very usually sits up on its haunches and holds the food with both fore-paws.

RACOON.

The skin of the Racoon forms a valuable fur, and the animal is, consequently, much sought after throughout the whole of its range, which extends over a considerable portion of North America. It is usually caught in traps, but is also hunted by Dogs. The hunt takes place at night, by the light of torches. The Racoon is pursued until he takes refuge up a tree, when the Dogs form a circle round the trunk, and an experienced climber swarms up to the animal's refuge, pursues him to the end of a branch, and then, by shaking the branch, makes him fall to the ground, when the Dogs have another turn. So active is the Racoon, and so dangerous when roused, that this operation often has to be repeated two or three times before he is finally caught.

The Crab-eating Racoon (*Procyon cancrivorus*) is a South American species, differing from the foregoing chiefly in the shortness of its fur, and its consequently slender shape. It is a far less handsome animal than its North American relative, which it resembles very closely both in structure and in habits.

THE COATI.*

The Coati is an animal of far less attractive appearance than the Racoon. The body is proportionally longer, the limbs are short, and the snout of a remarkable length and very pig-like: in fact, the head of a Coati reminds one strongly of that of a small dark-coloured Pig pulled out until the muzzle was two or three times its ordinary length. The snout is, moreover, very flexible, and the animal perpetually turns it about in various directions in a highly inquisitive way. The body is somewhat over half a yard in length, the tail a little shorter.

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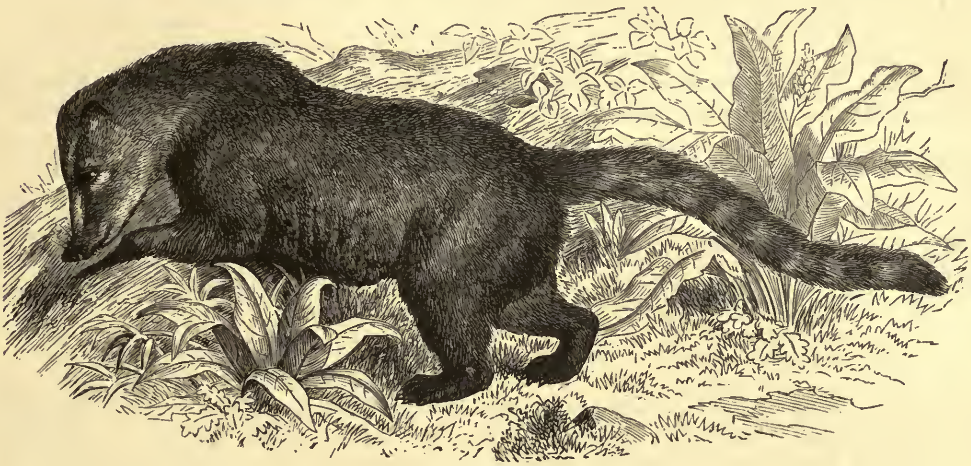
* *Nasua narica.*

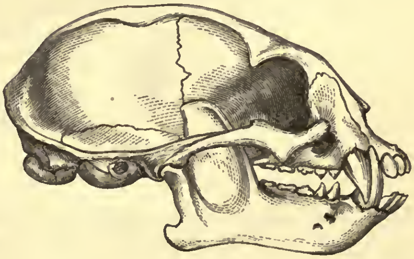
The fur is short and of a reddish or greyish-brown colour, the muzzle and feet are black, the tail ringed with black and brownish-yellow. Like the Racoon, it feeds upon fruit, insects, small birds, &c., and, like it, is a good climber. The specimens in the Zoological Gardens are in a constant state of activity, trotting about from one end of the cage to another, climbing over the tree trunk placed in their prison, and turning their queer-looking snouts about ceaselessly. The geographical range of the Coati extends from Mexico in the north to Paraguay in the south.



COATI.

THE KINKAJOU.*

Looking merely at the exterior of this animal, one would almost feel inclined to place it, as some of the earlier naturalists did, among the Lemurs: for, like them, it has a prehensile tail, one which can be coiled around branches to help its progress, precisely like that of a New World Monkey. It will be remembered that one member of the Civet family, the Binturong (p. 95), presents a similar peculiarity. But the Binturong's tail is a comparatively imperfect organ, merely prehensile at the tip, while that of the Kinkajou can be readily coiled two or three times round a branch. We thus see that the same remarkable adaptation to arboreal life which is found in the whole group of New World Monkeys appears in one species from each of two distinct families of Carnivores, one of which is confined to the Old World, while the other exists only in the New World. And we shall see the same character crop up once more, when we come to the group of pouched animals (Marsupials), in the American Opossums. It must, of course, be clearly understood that the possession of a prehensile tail is no sign whatever of any relationship between the animals possessing it. It may be taken as certain that it was produced quite separately in all the four cases we have mentioned in relation to the habits of the animal.



SCULL OF KINKAJOU.

The Kinkajou uses its paws in a wonderfully hand-like manner, and employs both fore and hind feet to bring food to its mouth. It will also hold a piece of bread in one hand, and break off pieces from it with the other, and this in spite of the fact that it has no opposable thumb, and that its fingers are short and webbed nearly to the claws. For the rest, it is a pretty, innocent-looking little animal, with a body about a foot long, and a tail of some eighteen inches, covered with soft brown fur, and walking on the soles of its fore feet, while in the hind feet the heel is well raised from the ground. The skull is remarkable for its rounded form, and for the shortness of its facial portion: on a superficial examination it looks almost Cat-like. It feeds upon fruit, eggs, insects, birds, &c. It is found in Mexico, Guatemala, and in the great forests of Peru and North Brazil.

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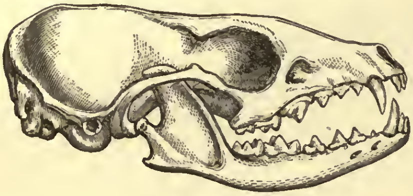
* *Cercoleptes caudivolvulus.*

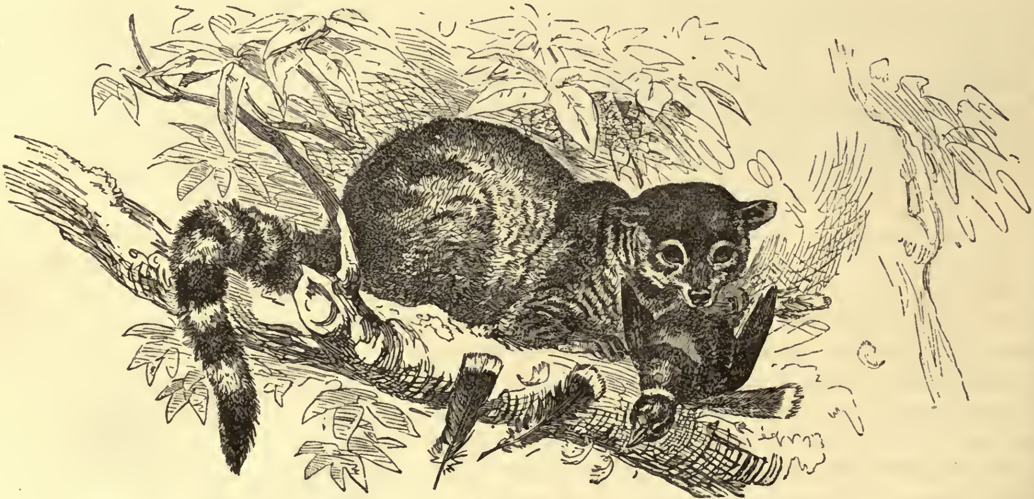
THE CACOMIXLE.*



SKULL OF CACOMIXLE.

The Cacomixle, Civet, or ring-tailed Cat, as it is indifferently called by the miners of the districts where it is found, is a puzzling little creature, which was, until quite recently, placed in the Civet family, and, in consequence, was looked upon as one of the chief difficulties in the way of explaining satisfactorily the present geographical distribution of animals, for all the other *Viverridæ* are Old World forms. Its true place has, however, at last been assigned to it, and the anomaly is at an end: for, like all other members of the Racoon family, it is confined to America, where it occurs in California, Texas, and the higher regions of Mexico.

The Cacomixle is about a yard long, two-fifths of this length being taken up by the tail. Its fur is brown, and its tail beautifully ringed. Its habits are entirely arboreal, and it makes a moss-lined nest in hollow trees. It has a curious habit of gnawing the wood round the entrance of the hole, so that hunters are able to tell whether a hollow tree is inhabited or not, by the presence or absence of *débris* of bark and wood at the root. It frequently trespasses into the miner's tent "and plunders his provision bag. When caught, as it often is, it becomes so familiar and amusing, and does so much to relieve the monotony of the miner's life, that it is highly valued, and commands quite a large price." It is said to be a capital mouser.



CACOMIXLE.

THE PANDA FAMILY.†

This group, which has received a most unfortunate name, as it belongs to the *Arctoidea* and not to the *Æluroidea*, contains only two genera, one of which has been recently discovered, while the other has been known for many years.

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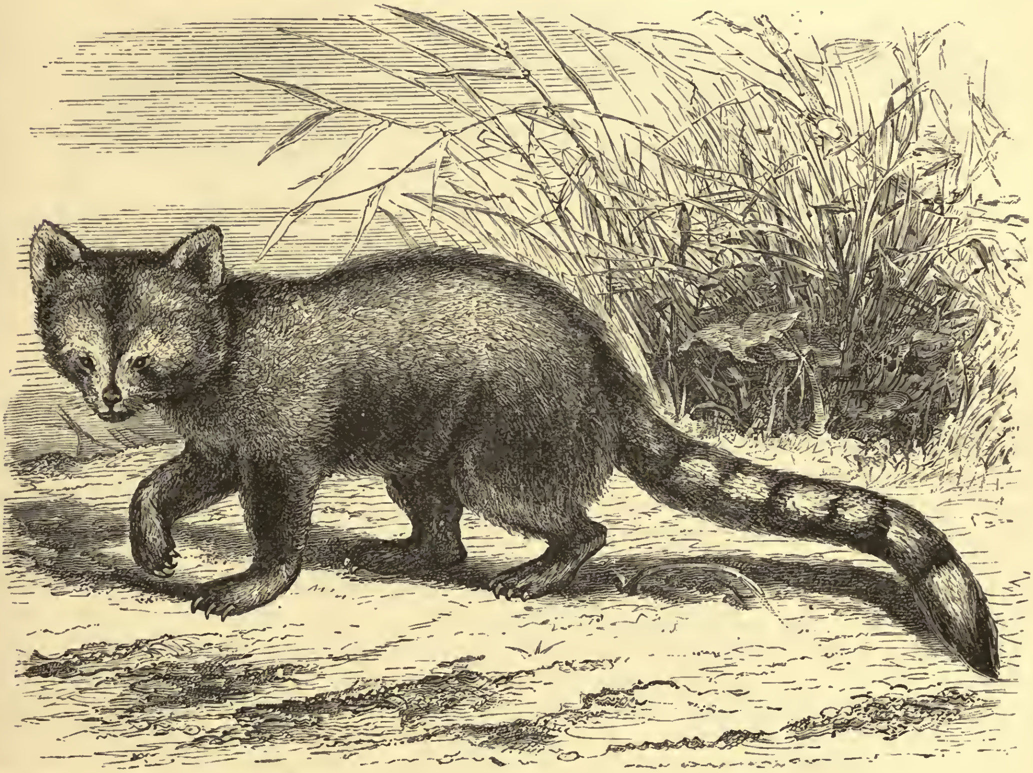
* *Bassaris astuta.*

† *Ailuridæ.*

THE PANDA*

Forms a striking object among the small Mammals. It is a really beautiful creature, rich red chestnut in colour on the upper surface, jet black as to the lower surface, the limbs also black, the snout and the inside of the ears white, the tail bushy, reddish-brown in colour, and indistinctly ringed. The fact of the under surface being black while the upper is bright reddish-yellow is remarkable; with most animals, when there is any difference in colour, it is the under surface which is lighter. The body and head are about half a yard long, the tail about a foot. The mode of progression is plantigrade, and the large curved claws are half retractile. The main anatomical characters are decidedly ursine, as also are the habits. Mr. Bartlett, who studied the Panda that found a home for a time at the Zoo, states that, when drinking, it sucked up the fluid like a Bear, instead of licking it up as a Dog or Cat would do. When offended it would rush at Mr. Bartlett, and strike at him with both feet, the body being raised like a Bear's and the claws projecting. It also, when angry, made a sharp spitting noise; at other times it used a "weak, squeaking call-note." On level ground it ran in the same manner as the Weasel, Otter, and Kinkajou, with a sort of jumping gallop, the back being kept much arched.



PANDA. (From the *Proceedings of the Zoological Society.*)

The Panda is found in the forests of the Eastern Himalayas, as well as in Eastern Tibet. It is sometimes known as the Wah, or as the Red Bear-Cat.

The only remaining member of this family has been discovered within the last few years in the mountains of East Tibet, by the Abbé David, and has been called by M. Alphonse Milne-Edwards *Ailuropus*. It is a large animal, nearly white, and very Bear-like in external appearance, although the structure of the skull and teeth shows clearly that its nearest allies are the Panda and the Racoon.

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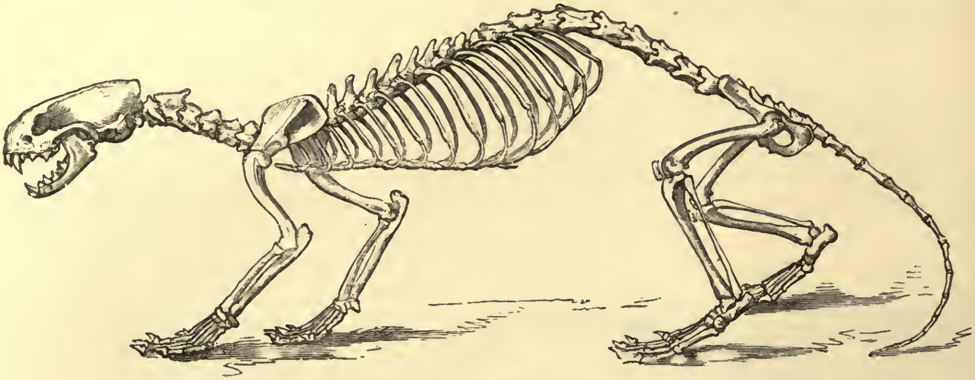
* *Ailurus fulgens.*

THE WEASEL FAMILY.*

This family, including the Weasels, Martens, Skunks, Gluttons, Otters, Badgers, &c., is the most heterogeneous assemblage of all the Carnivorous group. Its members have a very wide geographical distribution, being found in all parts of the world, except the West Indies, Madagascar, and the Australian region. They differ very much among themselves, but have, nevertheless, certain important characters in common, such as the structure of the ear-drum bone, which in essential respects resembles that of the Bears, as also do the organs of digestion. They all possess, beneath the root of the tail, anal glands, organs of similar nature to the civet-producing glands of the Viverridæ, but secreting a more or less noxious fluid. The number of animals in this family is very great, and it will be impossible to treat of any but the principal species. As a matter of convenience, the members of the group are often split up into sections, one (the true *Mustelidæ*) containing the Gluttons, Martens, Weasels, Ferrets, and Grisons; another (the *Melidæ*) consisting of the Badgers, Ratels, and Skunks; and a third (the *Lutridæ*) containing the Otters.



SKELETON OF WEASEL.

Many of these animals are looked upon as "vermin," but among them are some of the most valuable of the fur-producing animals: the Ermine, Sable, Mink, and Marten. These are all inhabitants of the Northern hemisphere, and the business of trapping them is a very important branch of industry, as may be gathered from the fact, quoted by Dr. Elliott Coues,† that "during the century 1769—1868, the Hudson's Bay Company sold at auction in London, besides *many millions* other pelts (skins), the following of *Mustelidæ*:—1,240,511 Sables; 674,027 Otters; 68,694 Wolverenes; 1,507,240 Minks; 218,653 Skunks; 275,302 Badgers; 5,349 Sea-Otters. In 1868 alone, the Company sold (among many thousand others), 106,254 Sables; 73,473 Minks; 14,966 Otters; 6,298 Skunks; 1,104 Wolverenes; 1,551 Badgers; 123 Sea-Otters; besides which were also sold in London, in the autumn of the same year, about 4,500 Sables; 22,000 Otters, &c."

THE GLUTTON.‡

The Glutton, or Wolverene, the largest of the Weasel group, is found over the greater part of the northern regions, both of the Old and New Worlds, being especially abundant in Siberia and Kamtchatka. It attains a length of some three feet four inches, ten inches of which go to the tail. It has a Dog-like snout, a broad or rounded head, short ears, an arched back, a short bushy tail, and long, dark brown or almost black fur. A band of pale reddish-brown runs along the sides, and unites with the corresponding band of the opposite side on the rump.

The skull is very strong and massive, and the jaws bear altogether thirty-eight teeth. The number of the incisors, canines, and premolars corresponds with that we have found in the Arctoids; but the molars are reduced to one on each side in the upper, and two on each side in the lower jaw.§

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* *Mustelidæ.* † "Fur-bearing Animals: a Monograph of North American Mustelidæ." ‡ *Gulo luscus.*

§ The dental formula is—Incisors, $\frac{3-3}{3-3}$; canines, $\frac{1-1}{1-1}$; premolars, $\frac{4-4}{4-4}$; molars, $\frac{1-1}{2-2} = 38$.

The mode of progression is semi-plantigrade, and the animal's movements are, compared with those of its nearest allies, the Martens and Weasels, slow and clumsy; unlike these, too, it is not a good climber, although the older accounts of its customs stated that it was in the habit of climbing trees, and dropping suddenly down upon large animals as they passed, and then destroying them as they fled in terror at the unexpected attack. In this, as in many other instances, the imagination has largely been called into play to supplement what was deficient in the actual observations of the writers. Probably few animals have given rise to so many or such wild fables as the Wolverene. Its name of *Glutton* is due to the mythical account of its habits given by an early writer, Olaus Magnus, who says: "It is wont, when it has found the carcass of some large beast, to eat until its belly is distended like a drum, when it rids itself of its load by squeezing its body betwixt two trees growing near together, and again returning to its repast, soon requires to have recourse to the same means of relief." It need hardly be said that this story must be taken *cum grano salis maximo.*

GLUTTON.

Besides its great strength, the Wolverene is noted for its excessive cunning, and the two qualities combined give it a power of destructiveness of which one would hardly expect any animal below a schoolboy to be capable. One of its favourite tricks is to frequent the "Marten-roads"—that is, the lines of traps for catching Martens—and one by one to demolish the traps, and carry off either the bait or the imprisoned animal. To make matters worse for the unlucky trapper, the Glutton's experience and knowledge of traps in general are so great that he shows equal skill in avoiding those set for his own benefit as in despoiling those meant for others; either he takes no notice of them, or carefully pulls them to pieces, and so gets the bait and outwits the hunter, without danger to himself. It is only in a trap constructed with the greatest care, and disguised so as to resemble a "câche," or store of hidden food, that the wary beast can be caught. Mr. Lockhart, an American writer, quoted by Dr. Coues, gives some really charming instances of his own experience in trying to get the better of his inveterate enemy. In one case, he had carefully buried a Lynx's skin in the snow, to the depth of some three feet; the snow was arranged so as to present a perfectly undisturbed appearance, and the Lynx's entrails and blood were strewed about, and its carcass left, so as to take off the scent. On returning next morning to his beautifully-made "câche," he found the carcass, &c., gone, but everything else apparently just as he had left it. His joy was great, but premature; for on digging, no skin was to be found: the Wolverene had stolen it during the night, but had added insult to injury by filling up the hole, and putting everything *in statu quo*.

Mr. Lockhart gives another equally astonishing instance of the Wolverene's ability:—"At Peel's River, on one occasion, a very old Carcajou [the trapper's name for the Glutton] discovered my Marten-road, on which I had nearly a hundred and fifty traps. I was in the habit of visiting the line about once a fortnight; but the beast fell into the way of coming oftener than I did, to my great annoyance and vexation. I determined to put a stop to his thieving and his life together, cost what it might. So I made six strong traps at as many different points, and also set three steel traps. For three weeks I tried my best to catch the beast, without success; and my worst enemy would allow that I am no green hand in these matters. The animal carefully avoided the traps set for his own benefit, and seemed to take more delight than ever in demolishing my Marten-traps, and eating the Martens, scattering the poles in every direction, and câching what baits or Martens he did not devour on the spot. As we had no poison in those days, I next set a gun on the bank of a little lake. The gun was concealed in some low bushes, but the bait was so placed that the Carcajou must see it on his way up the bank. I blockaded my path to the gun with a small pine-tree, which completely hid it. On my first visit afterwards, I found that the beast had gone up to the bait and smelled it, but had left it untouched. He had next pulled up the pine-tree that blocked the path, and gone around the gun and cut the line which connected the bait with the trigger just behind the muzzle. Then he had gone back and pulled the bait away, and carried it out on the lake, where he laid down and devoured it at his leisure. There I found my string. I could scarcely believe that all this had been done designedly, for it seemed that faculties fully on a par with human reason would be required for such an exploit, if done intentionally. I therefore re-arranged things, tying the string where it had been bitten. But the result was exactly the same for three successive occasions, as I could plainly see by the footprints; and what is most singular of all, each time the brute was careful to cut the line a little back of where it had been tied before, as if actually reasoning with himself that even the knots might be some new device of mine, and therefore a source of hidden danger he would prudently avoid. I came to the conclusion that *that* Carcajou ought to live, as he must be something at least human, if not worse. I gave it up, and abandoned the road for a period."

One very extraordinary habit of the Wolverene is shared by very few animals except man. It is stated by Dr. Coues that, when it meets a man, it will often, if it be to windward, approach within fifty or sixty yards, and then, sitting calmly down on its haunches, will shade its eyes with one fore-paw, and gaze earnestly at its enemy. This very human action it will often repeat two or three times before attempting to flee.

THE MARTEN.*

The Pine Marten is perhaps the most pleasing of the Weasel group, as far as appearance is concerned. Its long, lithe body attains a length of over half a yard; its tail is about a foot in length. The legs are short, though not nearly so short as in the Weasels, and its paws have five digits, armed with sharp claws. The snout is sharp and beset at the sides with long vibrissæ. The skin is very beautiful, dark-brown for the most part, lighter on the cheeks and snout, and on the throat and under side of the neck a light yellow.

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* *Mustela martes.*

The skull is much more elongated than either a Bear's or a Glutton's; the tympanic bullæ are slightly swollen, and the jugal arches, beneath which the jaw muscles pass, are comparatively narrow and slender. As in the Wolverene, there are thirty-eight teeth, eighteen in the upper, twenty in the lower jaw, and the molars are thoroughly carnivorous in character, being produced into sharp, trenchant, cutting edges.

The Pine Marten occurs over a considerable portion of Europe and Asia, and, amongst other places, in Great Britain, where, however, it is becoming rare. The finest specimens are said to come from Sweden.

This animal is essentially arboreal in its habits, inhabiting chiefly thick coniferous woods, whence its name of Pine Marten is derived. In the branches the female makes a nest of leaves or moss, and sometimes saves herself this trouble by ejecting Squirrels or Woodpeckers, and occupying the vacant dwellings. For its size it is, like all the *Mustelidæ*, extremely ferocious and strong. It attacks and kills Fawns, notwithstanding their superior size; from these down to mice, nothing comes amiss to it, and nothing is safe from its attacks.

The Beech Marten, or Stone Marten (*Mustela foina*), differs from the foregoing species in certain characters of the skull and teeth, as well as in the fact that the throat is white instead of yellow. Its habits are, on the whole, similar to those of the Pine Marten, but it is more often found away from woods, on the sides of mountains and rocks, or in the neighbourhood of farms. Its general distribution is the same as that of the Pine Marten, but it is decidedly more common than the latter in Great Britain.

THE PEKAN.*

The Pekan, or Pennant's Marten, is a North American species. It is much larger than either of the preceding, the body attaining a length of thirty inches from snout to root of tail, while the tail itself is about sixteen inches long. The face is more Dog-like than that of the Common Marten; the skin is brown, becoming lighter in the front part of the back, and presenting white patches on the chest and belly.

Like the Pine Marten, it is a good climber, but, unlike it, shows a partiality, not for the driest parts of the wood, but for the neighbourhood of water. Its chief food seems to be Mice, but it is also fond of stealing the fish used to bait traps—whence it is often called the Fisher—and Sir J. Richardson states that its favourite meal is the Canadian Porcupine, which it kills by a bite on its unprotected belly, and eats, notwithstanding the quills. Sometimes it is forced, by want of better food, to eat beech-nuts.

THE SABLE.†

This is another species of the same genus, important from the fact that it is the most valuable of the fur-producing animals. Its skin seems to have been even more precious in former times than now. A writer in the sixteenth century states that "forty of the best quality, which is the quantity usually packed in one bale, have been sold for more than a thousand pieces of gold."

The Sable is found in the northern parts of Asia, being especially abundant between the Lena and Kamstchatka. It differs markedly from the true Martens in the form of its head, which is conical, the apex of the cone being formed by the pointed snout, while from its base project the pointed, and, for a *Mustela*, large ears. The legs and feet, too, are larger and stronger than in the other species of this genus.

Sable-hunting is, naturally, a very important branch of industry, and forms the chief occupation of many of the Siberian tribes. The work is by no means an easy one; it entails miles of travelling in dark woods and through heavy snow-storms; the track of the Sables may have to be followed for long distances; and numerous traps must be skilfully set and visited daily. With all his trouble, the hunter often finds that "an Arctic Fox, or some other Carnivore, has eaten up the costly booty, leaving only a few fragments, as if for the express purpose of showing him how narrowly he has escaped earning forty, fifty, or sixty silver roubles."

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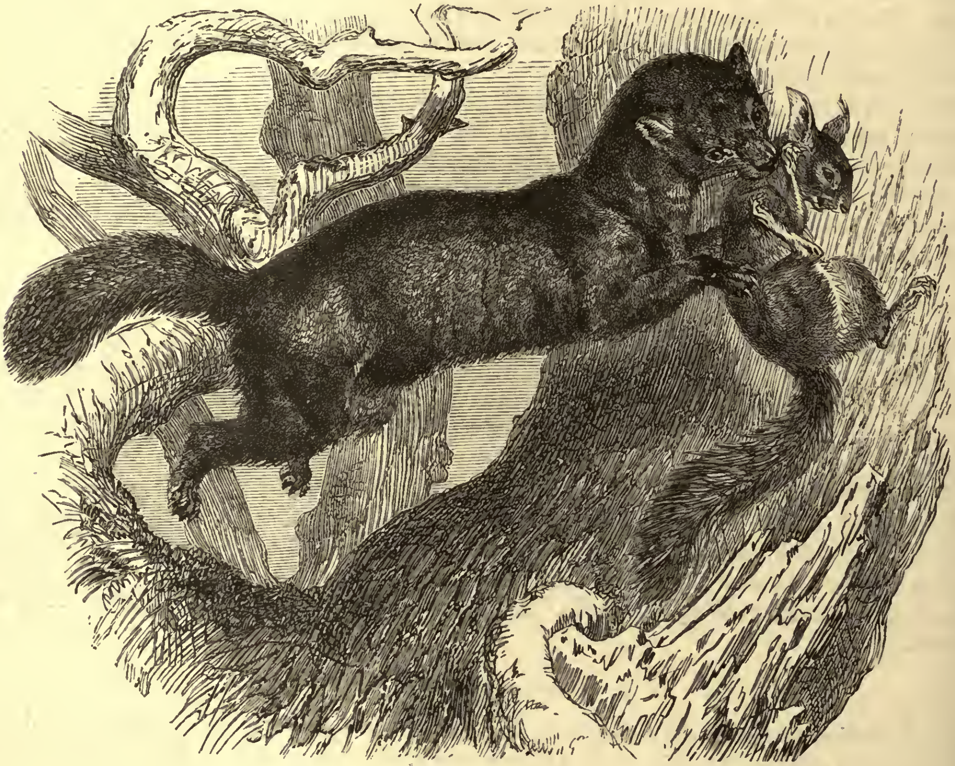
* *Mustela Pennantii.*

† *Mustela zibellina.*

The American Sable (*Mustela americana*), often called the Marten, is a closely allied species. It attains a length of eighteen inches, not including the tail, which measures about a foot more. Its capture gives the American trapper his staple occupation. It "is ordinarily captured in wooden traps of very simple construction made on the spot. The traps are a little enclosure of stakes or brush, in which the bait is placed upon a trigger, with a short upright stick, supporting a log of wood. The animal is shut off from the bait in any but the desired direction, and the log falls upon its victim with the slightest disturbance. A line of such traps, several to the mile, often extends many miles. The bait is any kind of meat, squirrel, piece of flesh, or bird's head. One of the greatest obstacles that the Sable-hunter has to contend with in many localities is the persistent destruction of his traps by the Wolverene and Pekan. . . . I have accounts from Hudson's Bay trappers of a Sable road fifty miles long, containing 150 traps, every one of which was destroyed through the whole line twice—once by a Wolf, once by a Wolverene. When thirty miles of the same road were given up, the remaining forty traps were broken five or six times in succession by the latter animal."*



SABLE.

THE COMMON WEASEL.†

The Weasel, like the remaining members of the genus *Putorius*, are very often called "vermiform," and a better name could scarcely be applied to them, for anything more worm-like could hardly be imagined in a hairy quadruped. The legs are extremely short in relation to the body, which is attenuated in the highest degree, and almost regularly cylindrical from one end to the other. Then the neck is of most disproportionate length, and carries the head out so far, that the fore legs appear as

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* Coues.

† *Putorius vulgaris.* The Weasel is very commonly referred to the genus *Mustela*, but this name properly belongs to the Martens.

COMMON WEASEL.

if placed quite at the hinder end of the chest, instead of in the front of it. The head passes almost insensibly into the neck, and the neck into the body. The head is flattened, and bears little glittering savage-looking eyes, and small rounded ears. The length from snout to root of tail does not exceed eight inches. The tail is about two inches long. The fur is light reddish-brown above, and white below; in northern latitudes the brown parts assume a much lighter colour in winter, so that the Weasel undergoes a change of coat similar to, but less extensive than, that undergone by the Ermine.

The Weasel is a good climber, and makes use of its skill in this accomplishment to prey upon birds, their eggs, and young. Rats and Mice are, perhaps, its staple food. Of these it makes great havoc, and is therefore a useful hanger-on to the farm-yard, notwithstanding its occasional depredations in the hen-roost. When it catches a Mouse or Rat, it gives it one bite on the back of the head, piercing the most vulnerable part of the brain, and killing instantly. Professor Thomas Bell says:— "I have observed that when a Weasel seizes a small animal, at the instant that the fatal bite is inflicted, it throws its long, lithe body over its prey, so as to secure it should the first bite fail, an accident, however, which I have never observed when a Mouse has been the victim. The power which the Weasel has of bending the head at right angles with the long and flexible, though powerful neck, gives it a great advantage in this mode of seizing and killing its smaller prey." The first part eaten is usually the brain. The stories of the Weasel's blood-sucking propensities are probably false, or at any rate grossly exaggerated.

The Weasel will pursue its prey over fields, in trees, in subterranean burrows, or across water. Like many of the wild Cats, it kills far more than is necessary for its support, and in pursuance of its favourite occupation of slaughter shows an unequalled courage and pertinacity. Its power of keeping its presence of mind under very trying circumstances is well shown in the following anecdote related by Bell:—A gentleman, "while riding over his grounds, saw at a short distance from him a Kite pounce on some object on the ground, and rise with it in his talons. In a few moments, however, the Kite began to show signs of great uneasiness, rising rapidly in the air, or as quickly falling, and wheeling irregularly round, whilst it was evidently endeavouring to force some obnoxious thing from it with its feet. After a sharp but short contest, the Kite fell suddenly to the earth, not far from where Mr. Pindar was intently watching the manœuvre. He instantly rode up to the spot, when a Weasel ran away from the Kite, apparently unhurt, leaving the bird dead, with a hole eaten through the skin under the wing, and the large blood-vessels of the part cut through."

THE ERMINE.*

The Stoat, or Ermine, is an important species closely allied to the Weasel, from which it differs chiefly by its greater size, and by the peculiarities of its colouring. In summer the upper parts vary from yellowish-brown to mahogany brown, while the under side is white tinged with sulphur-yellow, except on the throat, which is pure white. The tail is tipped with black. The brown upper and white under surfaces are separated by a perfectly distinct line of demarcation, which extends from the snout to the root of the tail, dipping down at the limbs, so as to include the outer surfaces of the latter in the dark area. In winter, on the other hand, the skin is, with the exception of the tip of the tail, which always remains black, pure white, tinged here and there with sulphur-yellow. Intermediate states between full winter dress and full summer dress are often found, and these, curiously enough, show their half-way character in two ways. Sometimes there is an alteration in level of the line of demarcation between the white and brown portions of the skin, the latter being occasionally found restricted to a narrow strip along the back, but remaining still without any admixture of white hairs. In other cases, again, the line of demarcation remains unaltered, but the dark portions become gradually lighter and lighter, until the final white dress is assumed.

As to the interesting question of the exact manner and cause of this change, it is sometimes stated that the direct influence of cold produces a rapid lightening in the colour of individual hairs, while there are also facts to show that the change is not due to an alteration in colour of existing hairs, but to a renewal of the coat, the hairs of one colour being replaced by those of the other. Dr. Elliott Coues, who has worked up the subject in an able and exhaustive manner, has satisfied himself that the change may take place in either way. Some of his specimens, "notably those taken in spring, show the long woolly white coat of winter in most places, and in others present patches—generally a streak along the back—of shorter, coarser, thinner hair, evidently of the new spring coat, wholly dark-brown. Other specimens, notably autumnal ones, demonstrate the turning to white of existing hairs, these being white at the roots for a varying distance, and tipped with brown. These are simple facts not open to question. We may safely conclude that if the requisite temperature be experienced at the periods of renewal of the coat, the new hairs will come out of the opposite colour; if not, they will appear of the same colour, and afterwards change; that is, the change may or may not be coincident with shedding. That it ordinarily is not so coincident seems shown by the greater number of specimens in which we observe white hairs brown-tipped. As Mr. Bell contends, temperature is the immediate controlling agent. This is amply proven in the fact that the northern animals always change; that in those from intermediate latitudes the change is incomplete, while those from farther south do not change at all." The advantage of the change to the animal is manifest; its colour becomes that of the snow over which it travels in pursuit of game, so that it is less easily seen and avoided. Unfortunately for it, however, a similar "protective colouring" is adopted by some of its victims.

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* *Putorius erminea.*

WEASEL (1) AND ERMINE (2) IN THEIR WINTER CLOTHING.

The habits of the Stoat resemble those of the Weasel; it is dangerous both to the sheep-fold and to the poultry-yard, but partly atones for its poaching by the immense number of Rats and Mice it is capable of destroying. Audubon relates that he "once placed a half-domesticated Ermine in an out-house infested with Rats, shutting up the holes on the outside to prevent their escape. The little animal soon commenced its work of destruction. The squeaking of the Rats was heard throughout the day. In the evening it came out, licking its mouth, and seemed like a hound after a long chase, much fatigued. A board of the floor was raised to enable us to ascertain the result of our experiment, and an immense number of Rats were observed, which, although they had been killed in different parts of the building, had been dragged together, forming a compact heap."

Both Weasel and Ermine are found over the greater part of Northern Europe, Asia, and America.

THE POLECAT.*

In form this animal does not differ very markedly from the Marten, except for the fact that its head is broader, its snout blunter, and its tail very much shorter: the latter being about five and a half inches, while the head and body together are nearly a foot and a half long. The neck is considerably shorter, and the body stouter than in the Weasel and Stoat. The fur is made up of hairs of two kinds, the shorter woolly and of a yellowish colour, the longer black or brownish-black and shining. One of its most marked characters is its horrible stench. This is produced, like the scent of the Civets, in a pair of glands near the root of the tail, which secrete a yellowish creamy substance of the most fetid character.

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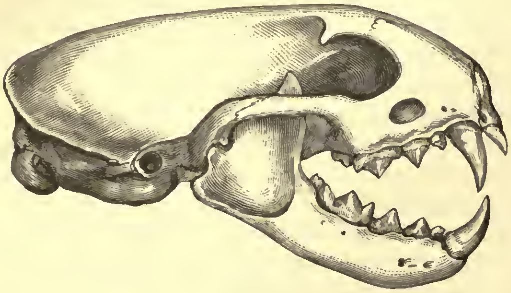
* *Putorius fœtidus.*


SKULL OF POLECAT. (*After Coues.*)

The Polecat is also known as the Fitchet (Fitchew of Shakspere), Foumart, or Foulimart: the latter names are said to be a contraction of "Foul Marten," thus distinguishing it from the Common or Sweet Marten, which is a comparatively inodorous animal. The name Polecat is probably a contraction of Polish Cat.

The Polecat is perhaps even more destructive than the other Mustelidæ, and is certainly a far greater plague to the farmer. Its ravage among Rabbits, Hares, and Partridges is immense, and if once it gets unobserved into a poultry-yard, the fate of a very considerable number of the inmates is sealed, as it possesses in a high degree the family love of slaughter for slaughter's sake. It has been known to kill as many as sixteen Turkeys in a single night; and, indeed, it seems a point of honour with this bloodthirsty little creature to kill everything it can overpower, and to leave no survivors on its battlefields. It has, too, an unfortunate liking for eggs, as well as for game and poultry, and in this way alone does great harm to preserves. There are also many accounts of its fondness of fish; Bell also quotes an instance in which a female Polecat was pursued to her nest, and was found to have laid up, in a side hole, a store of food, consisting of forty Frogs and two Toads, all of which she had skilfully "pithed," that is, bitten through the brain, so that, although retaining a certain amount of vitality, they were effectually prevented from running away!

1. POLECAT. 2. FERRET.

The Polecat is found throughout Northern Europe, not extending southwards into the warmer parts of the Continent, but being quite at home in snow-covered regions. It is essentially, like the Marten, a sub-arctic and temperate animal.

THE FERRET.*

This is a domesticated variety of the genus *Putorius*, of African origin. It shows its Southern nature by being, unlike the Polecat, unable to endure great cold; even an English winter is enough to kill it if not properly housed. It is an interesting animal, zoologically, from the fact that it is a true-breeding Albino, having the white fur and pink eyes of that peculiar "sport." It is a little smaller than the Polecat, with which it will breed with perfect readiness, producing hybrids intermediate in character between the two parent species.

Ferrets are much used, both in Britain and America, chiefly for killing Rats and for driving Rabbits out of their burrows. For the latter function the Ferret is muzzled, to prevent its killing the Rabbit in the burrow; the latter is either netted or killed immediately, as soon as it is driven out. The Ferret is also frequently employed to kill fowls for the table. Its particularly neat method of slaughtering by one bite in the neck is much admired by Ferret-fanciers, who make quite a pet of the animal. It, however, never shows the slightest affection for its master, and has usually to be confined: the necessity of this is shown in an instance, quoted by Bell, in which a child was attacked in its cradle, and only rescued after the veins of its neck had been severed, its face, neck, and arms lacerated, and its eyes so injured that the sight of one of them was permanently lost.

THE MINK.†

This important fur-producing animal is found in the northern parts of both hemispheres under various specific forms, the most important of which are the European Mink (*P. lutreola*) and the American Mink (*P. vison*). Although most nearly allied to the Stoats and Weasels, it shows a certain resemblance to the Martens in its larger and stouter body, which attains a length of from fifteen to eighteen inches, the tail being about seven or eight inches long, and bushy at the tip. Like most of its allies, it has two kinds of fur—"a soft matted under fur, mixed with long, stiff, lustrous hairs." The colour varies from dull yellowish-brown to dark chocolate-brown; the upper lip is usually white in the European, dark in the American species. The scent-glands are well developed, and their secretion is second only in offensiveness to that of the Skunk.

The habits of the Mink differ altogether from those of the other species of the genus. As Dr. Coues observes, "It is to the water what the other Weasels are to the land, or the Martens to the trees. It is as essentially aquatic in its habits as the Otter, Beaver, or Musk Rat, and spends, perhaps, more of its time in the water than it does on land. In adaptation to this mode of life, the pelage has that peculiar glossiness of the longer bristly hairs and felting of the close under fur which best resists the water." It feeds chiefly upon aquatic or amphibious animals, such as fish, frogs, crayfish, molluscs, and the like, but also preys largely upon the smaller Mammals. It is stated that it is not an indiscriminate slaughterer, but kills only what is necessary for its actual wants.

In America the Mink has been regularly domesticated and trained as a Rat-catcher, like the Ferret. "Minkeries" have been established in connection with farm-yards, and have proved in more than one instance eminently successful. The animals soon allow themselves to be handled, and besides becoming good Ratters, bring their owner a very considerable profit by their fur, for which alone it is well worth while to breed them, as the expense of keeping them is trifling.

THE GRISON.‡

This is a Weasel-like animal, found only in South America, and distinguished from its nearest relations, the Martens and Weasels, by the fact that the colour of the upper is lighter than that of the lower surface of its body, the former being grey, the latter dark brown. Its whole length is rather under a yard; of this not more than a third is taken up by the tail. It is found in plantations and in the neighbourhood of buildings, and makes its abode in hollow trees, clefts in rocks, and holes in the earth.

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* *Putorius furo.*

† *Putorius lutreola* and *P. vison.*

‡ *Galictes vittata.*

As to its disposition, some notion may be gained from a tale told by Bell of a tame specimen in his possession. He says that it "was very fond of Frogs, but these were not the only animals which were obnoxious to its voracity. On one occasion, in the winter, I had placed it in its cage, in a room with a fire, where I had also two young Alligators, which in general were stupidly tame. On going into the room in the morning, I found the Grison at large, and one of the Alligators dead, with a hole eaten under the fore-leg, where the great nerves and blood-vessels were torn through; and the other Alligator began snapping furiously at every one who attempted to approach it."

GRISON.

THE TAYRA.*

This animal may be considered without exaggeration to be one of the ugliest in the whole Carnivorous order. It is not unlike the Marten in shape, but of a dark brown colour, and with a low, villainous, and almost debauched expression of face. The head and body together attain a length of rather more, the tail of rather less, than half a yard. The colour of the pelage is dark blackish-brown, becoming lighter on the head and neck, on the under surface of which there is a yellowish spot. It is found, like the Grison, in South America, where it extends from Brazil and British Guiana in the north to Paraguay in the south.

It lives in forests, preying upon small mammals and birds, and does its hunting chiefly in the morning, starting for work at sunrise, and returning about midday.

THE RATEL.†

This animal, sometimes known as the Honey Badger, is one of the exceptional animals whose colour is lighter above than below. Its stiff, wiry hair is ashy-grey on the upper surface, while on the under surface, the muzzle, limbs, and tail are black. The line of demarcation between the grey and black is so sharp, that the animal has the appearance of being really black, but covered, as to its back, with a grey cloak. It is about three-quarters of a yard long, the tail taking up about a sixth of the length. In the matter of teeth it is interesting, as its molars are reduced to one on each side in each jaw: a reduction equal to that found in the Cats.

It is said to live largely on Bees, and to show a great amount of skill in tracking to their nest the insects which it observes on the wing. Sparrmann states that it seats itself on a hillock to look out for the Bees, and shades its eyes with one fore-paw against the rays of the setting sun.

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* *Galictes barbara.*

† *Mellivora capensis* and *M. indica.*

It is a stupid animal, very sleepy during the day, and issuing from its burrows at sunset to seek for the birds, tortoises, insects, and worms on which it feeds. It is very tenacious of life, and is well protected from attacks by the thickness and looseness of its skin, and the thick subcutaneous layer of fat. It also possesses an additional means, if not of defence, at least of offence, in its tail glands, the secretion of which is very strong and pungent as to its odour. It is still further advantaged by its burrowing powers; it will scratch up a hole, and disappear into it in an incredibly short space of time.

RATEL.

The Ratels in the Zoological Gardens in Regent's Park (where the habits of all the animals will repay the study of the most casual observer) exhibit a remarkable peculiarity. We have very frequently watched one of them run round and round his cage in the usual purposeless manner of captive animals, but with this peculiarity: when he reached a particular corner of the den, he quietly, and without effort, turned over head and heels, and then went on again. On one occasion, after he had been doing this with great regularity for some rounds, he seemed to become abstracted, and passed the usual spot without the somersault. When, however, he had proceeded a few paces, he recollected himself, stopped for a moment, returned to the exact place, turned over as usual, and proceeded without further let or hindrance.

There are two species of Ratel, one, the Cape Ratel (*Mellivora capensis*), occurs in South Africa, the other, or Indian Ratel (*M. indica*), being found in India.

THE COMMON BADGER.*

The Badger is the largest of the indigenous Carnivora of Great Britain; for although the length of its body is not quite equal to that of the Fox, in bulk it far exceeds the slender and active Reynard. It is, indeed, a heavy and somewhat clumsy animal, long and stout-bodied, and short-legged, with a tapering and mobile snout, and a short scrubby tail. The long hair is of three colours: black, white, and reddish, the mingling of the three producing a varying grey hue. The head is white, except for a black band on each side, which commences a little behind the nose, and extends backwards, including the eye and ear, the tip of the latter being, however, white. The lower parts of the body and the legs are black, the tail grey. The length of the body from snout to root of tail is about two feet three inches; that of the tail, seven inches and a half.

It is fond of retired places, such as sheltered woods, and in them it makes for itself a large burrow or earth "which has but a single entrance from without, but afterwards divides into different chambers, and terminates in a round apartment at the bottom, which is well lined with dry grass and hay." The Badger is consequently a very skilful digger, and for this purpose is possessed of strong curved claws. Its diet is completely mixed: it eats roots, fruit, eggs, small mammals, frogs, insects, &c. It is quite susceptible of domestication, and is said to show a vast amount of affection and good temper. As to its habits, we cannot do better than quote an excellent account of some half-domesticated Badgers given in a letter to *The Times* by Mr. Alfred Ellis, of Loughborough:—"About ten years since, the Badger was established here, but it was not until the third attempt that my efforts prospered. The Badgers then introduced, or their successors, have bred every year, and as not more than one pair remain in permanent occupation it is probable that there are many more of these animals in this country than is generally supposed; but their shyness, their colour, and the short time they require to obtain their food, and the recesses of the woods in which they delight to dwell, make it no easy task to study their life and habits. The deep earth in which our Badgers live is only fifty yards from the window at which I write. The building of this house two years ago did not disturb them, and they have shown an increasing confidence and trust. The Badger breeds later than the Fox, and it was the middle of March this year before the preparations for the coming family were made. These consisted in cleaning out the winter bed, and replacing it by a quantity of dry fern and grass, so great that it would seem impossible the earth could receive it. In June the first young Badger appeared at the mouth of the earth, and was soon followed by three others, and then by their mother. After this, they continued to show every evening, and soon learnt to take the food prepared for them. The young are now almost full grown, and, forgetting their natural timidity, will feed so near that I have placed my hand on the back of one of them. The old ones are more wary, but often feed with their family, though at a more cautious distance. Their hearing and sense are most acute, and it is curious to see them watch, with lifted head and ears erect, then, if all is quiet, search the ground for a raisin or a date. But the least strange sight or sound alarms them, and they rush headlong to earth with amazing speed.

"The Badger, like the Bear, treads upon the whole heel, and its walk closely resembles that animal. They caress each other in the same grotesque manner while they gambol and play, and at times they utter a cry so loud as to startle any one ignorant of its source. It is not unlike the chatter of the Stoat, but many times louder. On fine evenings we can watch them dress their fur-

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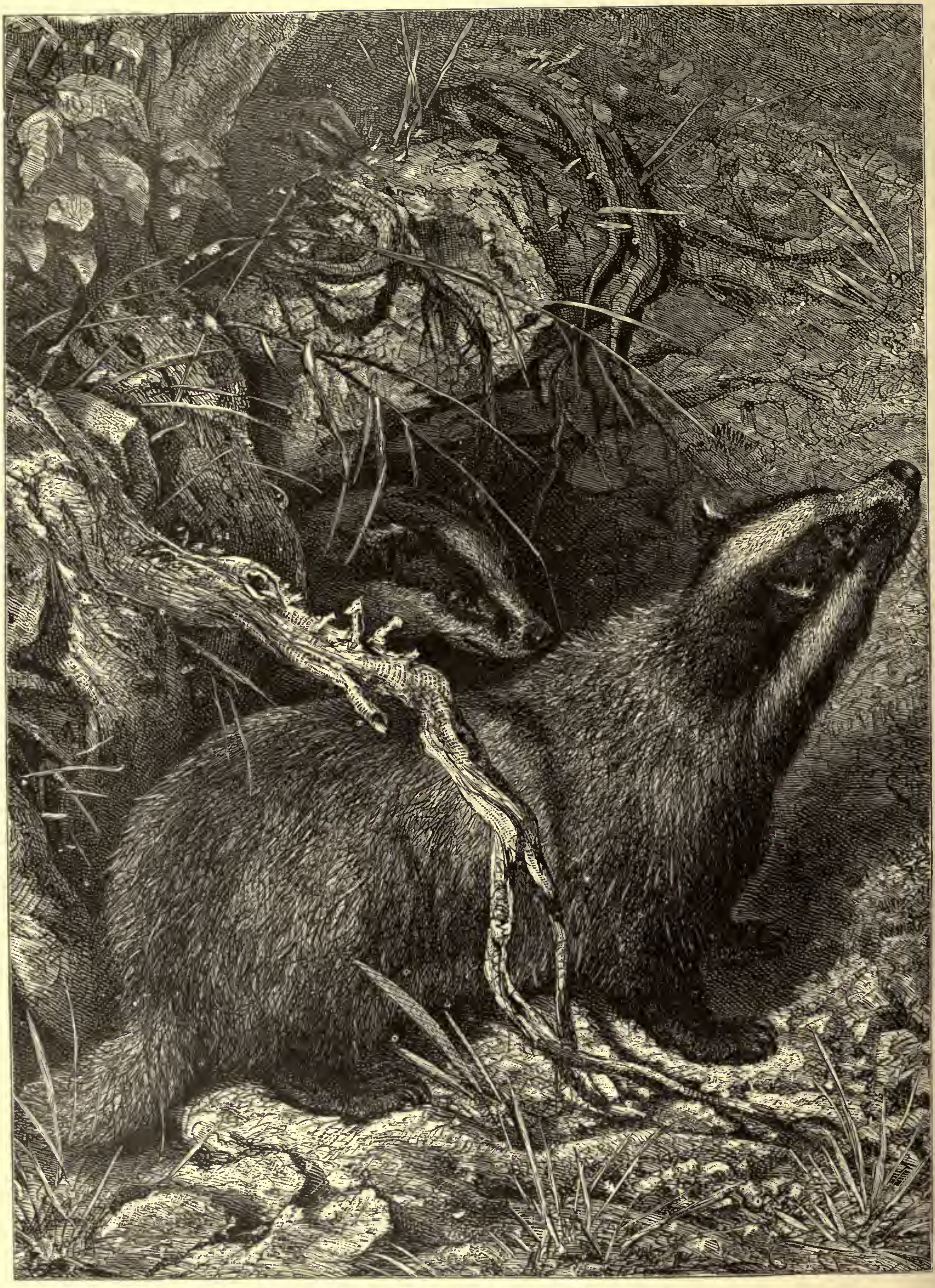
* *Meles vulgaris.*

CALIFORNIA



BADGER.

like coats, or do kind offices for each other, and search for parasites after the manner of Monkeys. No creature is more cleanly in its habits. Over their earth hangs a birch-tree, from which grows a horizontal bough eighteen inches from the ground. On this they scrape their feet in dirty weather, and keep their house inodorous by depositing their excrement at one place for many months and covering it with earth. The hibernation of the Badger is not like that of the Hedgehog—continuous and complete—but is irregular, and is probably influenced by the character of the winter. I have known the mouth of the earth covered with a coat of snow for fourteen days, and it might have been much longer before they came forth, while they may sometimes be tracked in a thin snow for a long distance.

"As the winter approaches, the old bedding is replaced by dry fern and grass, raked together by their powerful claws. This is often left to wither in little heaps till dry enough for their purpose. Partially concealed, I have watched a Badger gathering fern and using a force in its collection quite surprising.

"Bell, in his 'Quadrupeds' quotes Buffon as stating that Badgers are fond of Wasps' nests. This is true, for, like the Bear, they love honey and sweet food. I once heard a pair of Badgers fighting, and crept upon the ground until within a few yards of the angry conflict, but the bracken hid them from view. Next morning I visited the place. A Wasps' nest had been stormed and eaten; very little of the comb remained, and not a dozen homeless Wasps. That summer I myself saw the wrecks of seven Wasps' nests taken by the Badgers in one field, and this autumn they are digging out every one they can find.

"The Badger and and the Fox are not unfriendly, and last spring a litter of cubs was brought forth very near the Badgers; but their mother removed them after they had grown familiar, as she probably thought they were showing themselves more than was prudent."*

Although far from common, the Badger is found in many parts of Great Britain and on the Continent. Closely allied species occur over a great part of Northern Europe and Asia.

In former times it was in great requisition for the so-called sport of "Badger-baiting," in which charming and refined amusement the unhappy animal was put into a barrel and attacked by an unlimited number of Dogs, amongst whom it was often able to do considerable execution, thanks to its sharp teeth and powerful jaws.

THE AMERICAN BADGER.†

The distinction between this species and the European Badger consists chiefly in the shorter and more hairy character of the snout, and in the fact that the body is of a uniform whitish hue, sometimes shaded with grey or tawny. The body and head together are about twenty-four inches long, the tail six inches. It is found throughout the greater part of North America.

In its shyness, its general mode of life, and its habits, it differs but slightly from the Common Badger. Although in many parts it is so numerous that its burrows form a very serious obstacle to the traveller, yet it is a comparatively rare thing to see a specimen, so immediately does it retire to its strongholds on the first intimation of man's approach. It can, however, be trapped without much difficulty, and thousands are caught in this way every year. In 1873 the Hudson's Bay Company sold 2,700 in London alone. Dr. Coues quotes an interesting account of the habits of a captive Badger. He says:—"In running, his fore-feet crossed each other, and his body nearly touched the ground. The heel did not press on the ground like that of the Bear, but was only slightly elevated above it. . . . We have never seen any animal that could exceed him in digging. He would fall to work with his strong feet and long nails, and in a minute bury himself in the earth, and would very soon advance to the end of a chain ten feet in length. In digging, the hind as well as the fore-feet were at work, the latter for the purpose of excavating, and the former (like paddles) for expelling the earth out of the hole; and nothing seemed to delight him more than burrowing in the ground. He seemed never to become weary of this kind of amusement; and when he had advanced to the end of his chain he would return and commence a fresh gallery near the mouth of his first hole. Thus he would be occupied for hours, and it has been necessary to drag him away by main force. He lived on good terms with the Racoon, Grey Fox, Prairie Wolf, and a dozen other species of animals. He was said to be active and playful at night, but he seemed rather dull during the day, usually lying rolled up like a ball, with his head under his body for hours at a time."

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* *The Times*, Oct. 24th, 1877.

† *Taxidea americana.*

THE TELEDU.*

This animal, sometimes called the "stinking Badger," is found only in Java and Sumatra, and in those islands only on mountains having an elevation of more than 7,000 feet above the sea. It is a little more than a foot long; has a pig-like head, a stout body, very short legs, and a stumpy tail, not more than an inch long. The feet are plantigrade. It is of a dark brown colour, with the exception of a white band running along its back. But one of its chief characteristics is its power of ejecting, from its tail-glands, a volatile fluid, the odour of which is said to be even as bad as that of the Skunk.

The Teledu lives in burrows during the day, and comes out at night to seek its food, which consists chiefly of earth-worms, insects, and their larvæ.

THE CAPE ZORILLA.†

An ally both of the Skunks and Badgers, the Zorilla may be said to take the place of the former animals in Africa, through the whole of which continent it extends, reaching also into Asia Minor. The body, which attains a length of about a foot, is moderately stout, of a shining black ground-colour, and marked with white bands and spots. The snout is elongated like that of the South American Skunk (*vide infra*); the tail is bushy, about eight or nine inches long, and striped or spotted.

The Zorilla lives upon small mammals, birds, and their eggs, as well as amphibia and crustacea. It is a determined enemy to poultry, and entails great loss to the inhabitants of the districts where it is found, but is often tamed, and used to catch Rats and Mice. In the matter of scent, the secretion in its tail-glands is worthy of comparison with that of the Skunk itself.

An allied form is the Indian genus *Helictis*, a Weasel-like animal with a long body, and of a grey-brown colour, white underneath, and marked along the back with a white stripe. The tail is long and bushy. This animal is found from Nepaul to Java in the south, and Formosa in the east.

THE COMMON SKUNK.‡

This notorious American species is a stoutly-built animal, with short legs, a long conical head with a truncated snout, and a long bushy tail. The general colour of the fur is black, or nearly so, but on the forehead there is a white streak, and on the neck a white patch, from which two broad bands of the same hue proceed backwards along the upper surface of the body. The length from tip of snout to root of tail is something over a foot; the tail itself is less than a foot in length. The general appearance of the animal is decidedly Badger-like; it has, in fact, a good deal of resemblance both to the Ratel and to the Teledu. As in the Weasel, Ermine, and Polecat, there is one molar on each side of the upper, two on each side the lower jaw; altogether there are thirty-four teeth. It occurs throughout the whole of the temperate portion of North America.

We have mentioned that several of the Weasel family enjoy the distinction of being able to eject a foul-smelling fluid from glands at the root of the tail. In this accomplishment the Skunk is the undoubted chief. It can eject its perfume to a considerable distance, and with unerring aim: and the smell! The "odour of mingled guano and Polecat," which, according to Mr. Kingsley, distinguishes the ancient Cornish dainty squab-pie, is simply nothing in comparison with the horrible stench emitted by this little animal. It is so durable, that the spot where a Skunk has been killed will often retain the scent for days, or even weeks; indeed, Audubon relates that at one place where a Skunk had been killed in the autumn, the odour was quite perceptible in the following spring after the snow had melted. Clothes defiled with the secretion cannot be thoroughly cleansed by any ordinary means: for even if the scent seems to have disappeared, it will make itself evident every time the wearer goes near a fire, or into the sun. Notwithstanding this, furriers have found out a way for effectually purifying Skunk-skins, which are now a good deal used as furs. In Britain, where the Skunk is not known in the flesh, these furs are called by their right names, but in America, where the inhabitants do not enjoy the same blissful ignorance of this noxious beast, they are dignified with the appellation of "Alaska sable."

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* *Mydaus meliceps.*

† *Ictonyx zorilla.*

‡ *Mephitis mephitica.*

But the scent of the secretion is not its worst feature. Sir John Richardson quotes Mr. Graham as saying "that he knew several Indians who lost their eyesight in consequence of inflammation, produced by this fluid having been thrown into them by the animal," and continues, "I have known a dead Skunk, thrown over the stockades of a trading-port, produce instant nausea in several women, in a house with closed doors, upwards of a hundred yards distant." Dogs often suffer from inflammation of the eyes after being squirted with the fluid, and appear to be almost distracted with the pain. Curiously enough, the secretion has been recommended as a cure for asthma. "The story is told of an asthmatic clergyman who procured the glands of a Skunk, which he kept tightly corked in a smelling-bottle, to be applied to his nose when his symptoms appeared. He believed he had discovered a specific for his distressing malady, and rejoiced thereat; but on one occasion he uncorked his bottle in the pulpit, and drove his congregation out of church."*

SKUNK.

The efficacy of the secretion as a defensive weapon for the not otherwise formidable animal is greatly enhanced by the distance to which it can be ejected. This is probably as much as twelve or fourteen feet, while the smell itself can be perceived for a comparatively immense distance.

Besides its perfume, the Skunk has yet another claim to careful avoidance: its bite has been known in many cases to produce hydrophobia, in a form quite indistinguishable, according to an American surgeon, Dr. Janeway, from that induced by the bite of a rabid Dog.

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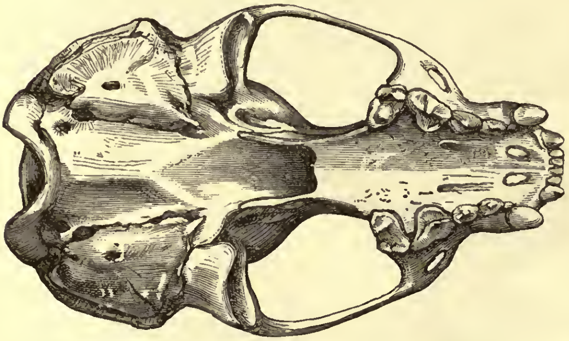
* Coues.

An allied species, the Little Striped Skunk,* is less than a foot long, and the tail is shorter than the body. The fur is black, and marked with numerous white stripes and spots. It is found in the southern part of the United States, and is said to be readily capable of domestication, proving very serviceable as a Mouser. Of course, under these circumstances, the glands are removed while the animal is young.

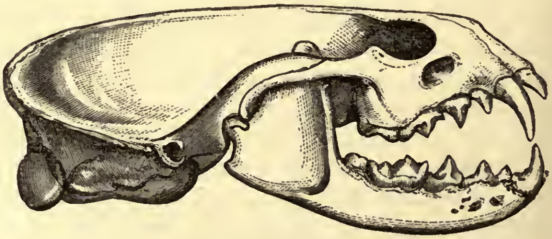
The White-backed Skunk† is the South American form of the genus. It occurs throughout that Continent as well as in Mexico and the south-western portions of the United States. It is much larger than the northern species, attaining a length of from eighteen inches to two feet, and is further distinguished by its short white tail, which does not exceed nine or ten inches in length, its pig-like snout projecting a full inch beyond the mouth, and its white back sometimes marked by a median black stripe. The rest of the fur is, as usual, black.

Our friend, Mr. Purdie, whose acquaintance with the Skunk in South America has been of the most practical kind, assures us that when about to discharge its secretion, the animal invariably faces round, so as to look its enemy full in the face, throws its tail over its back, and allows the breeze to carry the fluid in the desired direction. This method of discharge seems highly unaccountable, and difficult to reconcile with the anatomical facts; but it would be certainly going too far to say that it is impossible. Dr. Coues, who has repeatedly observed the North American Skunk, states that the animal invariably turns its back to its intended victim.

THE COMMON OTTER.‡


UNDER VIEW OF SKULL OF COMMON OTTER. (*After Coues.*)

We now come to the most thoroughly aquatic of the Fissipedia, the sub-family of Otters, animals which, although quite capable of active and unembarrassed movement on land, are yet thoroughly at home only in the water. In accordance with this mode of life, the toes are webbed, and provided with very short claws, and the tail is long, tapering, and flattened, so as to serve the precise purpose of the corresponding appendage in a fish. The length of the head and body is about two feet, that of the tail, one foot five inches. The fur is of a soft brown colour, becoming lighter on the under side of the throat and the breast, and consists of long, coarse, shining hairs, with a short under-fur of fine texture, well calculated to preserve equality of temperature as the animal resorts alternately to land or water. The skull is greatly elongated, and flattened from above downwards; the facial part of it is small, as compared with the brain-containing or cranial part. The region of the skull between the eyes is very narrow, and its floor is wide and thin. In all these points, save the first mentioned, the skull of the Otter approaches that of the Seal. As to the teeth, there is one premolar less on each side of the lower jaw than in the Martens,§ and both molars and premolars have sharp-pointed cusps, quite like those of the other *Mustelidæ.*


SIDE VIEW OF SKULL OF COMMON OTTER. (*After Coues.*)

The habits of the Otter are so entirely aquatic, that in the good old times it was thought to be a sort of cross between a beast and a fish, just as the Bat was thought to be intermediate between a beast and a bird. So deeply rooted was this opinion that the Otter's flesh

* *Mephitis* (or *Spilogale*) *putorius.*

† *Mephitis* (or *Conepatus*) *mapurito.*

‡ *Lutra vulgaris.*

§ The dental formula is—Incisors, $\frac{3-3}{5-3}$; canines, $\frac{1-1}{1-1}$; premolars, $\frac{4-4}{3-3}$; molars, $\frac{1-1}{2-2} = 36$.

was considered quite fishy enough to be eaten by devout Catholics on fast days. To this Izaak Walton alludes in a well-known passage in his "Complete Angler."

> "*Piscator.* 'I pray, honest huntsman, let me ask you a pleasant question: do you hunt a beast or a fish?'
>
> "*Huntsman.* 'Sir, it is not in my power to resolve you; I leave it to be resolved by the College of Carthusians, who have made vows never to eat flesh. But I have heard the question hath been debated among many great clerks, and they seem to differ about it, yet most agree that her tail is fish; and if her body be fish too, then I may say that a fish will walk upon land.'"

The movements of the Otters in water are marvellous. They swim about in families, performing the most astonishing pranks, from mere exuberance of spirits and excess of energy. Nothing can give a better idea of their activity, than the description of them in that most delightful of natural history books and fairy tales, "Water Babies."

"Suddenly Tom heard the strangest noise up the stream; cooing, and grunting, and whining, and squeaking, as if you had put into a bag two Stock Doves, nine Mice, three Guinea-pigs, and a blind puppy, and left them there to settle themselves and make music. He looked up the water, and there he saw a sight as strange as the noise; a great ball rolling over and over down the stream, seeming one moment of soft brown fur, and the next of shining glass: and yet it was not a ball; for sometimes it broke up and streamed away in pieces, and then it joined again; and all the while the noise came out of it louder and louder.

"Tom asked the Dragon-fly what it could be: but, of course, with his short sight, he could not even see it, though it was not ten yards away. So he took the neatest little header into the water, and started off to see for himself; and, when he came near, the ball turned out to be four or five beautiful creatures, many times larger than Tom, who were swimming about, and rolling, and diving, and twisting, and wrestling, and cuddling, and kissing, and biting, and scratching, in the most charming fashion that ever was seen. And if you don't believe me, you may go to the Zoological Gardens (for I am afraid that you won't see it nearer, unless, perhaps, you get up at five in the morning, and go down to Cordery's Moor, and watch by the great withy pollard which hangs over the backwater, where the Otters breed sometimes), and then say, if Otters at play in the water are not the merriest, lithest, gracefullest creatures you ever saw."

The Otter makes a sort of nest in hollows in the banks of the river in which it lives, but does not, as is sometimes stated, construct complicated burrows: its claws, indeed, are too weak for any such work. It usually confines itself to rivers, but is sometimes found on the sea-shore.

Otter hunting was formerly a very favourite sport. It was conducted with a special breed of Dogs—the Otter-hound—(see p. 141), and the spear was used for killing the animal when brought to bay.

Otters are quite capable of domestication, and may be taught to catch fish for their masters. For this purpose they must be caught young, and gradually brought to live upon bread and milk. When this end is attained, they are taught to fetch and carry, like a Dog—first sticks, &c., then a stuffed fish, then a dead one. When this part of their education is perfect, and they make no attempt to mangle the fish given to them, they are sent into the water to catch living fish. Otters are trained for this purpose in India, and also in China, where they are used by the fishermen of the Yang-tse-kiang. Mr. J. Thomson* says:—"We noticed men fishing with trained Otters in this part of the river. There were a number of boats, and each boat was furnished with an Otter tied to a cord. The animal was thrust into the water, and remained there until it had caught a fish; then it was hauled up, and the fisherman, placing his foot upon its tail, stamped vigorously until it had dropped its finny prey."

There is one peculiar habit of the Canadian Otter† which is worthy of mention. "Their favourite sport is sliding, and for this purpose in winter the highest ridge of snow is selected, to the top of which the Otters scramble, when, lying on the belly, with the fore-feet backwards, they give themselves an impulse with their hindlegs, and swiftly glide head foremost down the declivity, sometimes for the distance of twenty yards. This sport they continue apparently with the keenest enjoyment until fatigue or hunger induces them to desist."

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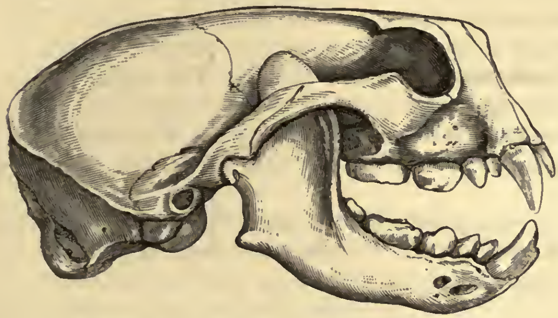
* "Malacca, Indo-China, and China."

† *Lutra canadensis.*

COMMON OTTERS.

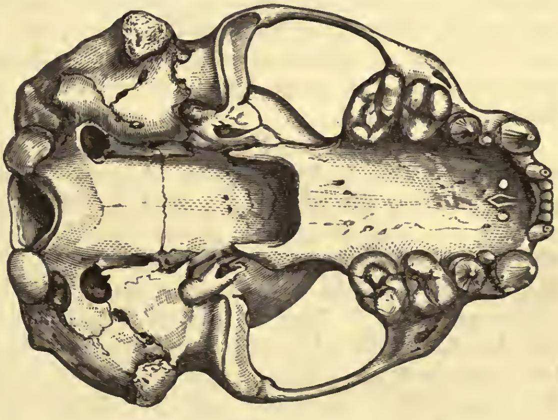
In the Margined-tailed Otter* the skull characters, which we have mentioned as distinctive of Otters, especially the narrowness of the region between the eyes, and the shortness of the nasal region, are so exaggerated, that the animal approaches towards the Sea Otter, of which we shall speak next. The Margined-tailed Otter, which is found in Brazil and Surinam, derives its name from a longitudinal ridge on each side of its conical tail. The fur is of a bright bay-brown colour, both above and below.


SIDE VIEW OF SKULL OF SEA OTTER. (*After Coues.*)

THE SEA OTTER.†

This interesting animal differs in many important respects from the Common Otter, and in all such points shows an approximation to the structure of the Seals. It is a large animal, about three feet long, not counting the tail, which is about a foot more. Its fur is dark brown, both on the upper and lower surfaces, and presents a frosted or silvered appearance, owing to the fact that the long stiff hairs, which differ greatly from those of the under-fur, are grey or colourless at the tip. The head is very short, the snout naked; the eyes extremely small, and placed low down on the sides of the head, and the whiskers are short, but stout and stiff, and mostly directed downwards; altogether there is something very Seal-like about the face. The fore-limbs and feet are small, the paws rather Cat-like in their rounded form, and the claws are quite hidden by the hair. The hind feet, on the other hand, are flat and expanded, being no less than six inches long by four broad, and webbed like a Duck's feet, or a Seal's flippers; they differ, however, from the Seal's, in the fact that the toes increase in length from the inner to the outer side; both above and below they are covered with dense fur, which quite hides the short, stout claws. The skull is, both in its cranial and facial portions, much shorter in comparison with its width than in the ordinary Otters; its base is extremely broad, and both upper and lower jaws bear on each side only eight teeth, so that there are altogether thirty-two teeth, or four less than in the Common Otter.‡ This diminution in number is brought about, as will be seen from the formula below, by reducing the upper premolars from four to three, and the lower incisors from three to two on each side. The form of the grinders differs altogether from what we have found, not only in the Mustelidæ, but in all the Land Carnivores. Their grinding surfaces present no sharp cusps, or jagged cutting edges, as in most Carnivorous forms; neither are they provided with numerous small tubercles and ridges, as in the Bears; but the surface of each is raised into a small number of rounded eminences, reminding one of the "roches moutonnées" of a glacial district, or, as Dr. Coues remarks, differing from the teeth of ordinary Carnivores, as water-worn pebbles differ from fresh-chipped angular pieces of rock.

The Sea Otter is found in the North Pacific, chiefly in the regions of Kamstchatka and Alaska, and extends as far south as California.


UNDER VIEW OF SKULL OF SEA OTTER. (*After Coues.*)

Like the Seal, the Sea Otter is gregarious, being often found "in bands numbering from fifty up to hundreds. When in rapid movement, they make alternate undulating leaps out of the water, plunging again as do Seals and Porpoises. When in a state of quietude, they are much of the time on their backs. They are frequently seen in this posture, with the hind flippers extended, as if catching the breeze to sail or drift before it. They live on Clams, as well as Crabs and other species of Crustacea; sometimes small fish. When the Otter descends and brings up any article of food, it instantly resumes its habitual attitude on the back to devour it. On sunny days, when looking, it sometimes shades its eyes with one fore paw, much in the same manner as a person does with the hand."* This curious habit, as we have seen, is adopted also by the Glutton. The supine position is so habitual that the females actually sleep in the water on their backs, with the young ones clasped between their fore paws. While in this position, too, the Otter will toss a piece of sea-weed backwards and forwards from paw to paw, like a ball, and the mother play with her offspring for hours together.

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* *Pteronura Sandbachii.*

† *Enhydra lutris.*

‡ Dental formula—Incisors, $\frac{3-3}{2-2}$; canines, $\frac{1-1}{1-1}$; premolars, $\frac{3-3}{3-3}$; molars, $\frac{1-1}{2-2} = 32$.

The fur is very valuable, and the animal is consequently hunted regularly; so regularly, that there is every possibility of the species becoming speedily extinct unless some check is put upon the chase. For taking some action in the matter, there is the further reason that the natives of the Aleutian Isles, the chief resort of the animal, are dependent on its hunting for their subsistence, and it has been shown that the people have diminished in numbers coincidently with the Otters.

FEMALE SEA OTTER SWIMMING ON HER BACK WITH YOUNG IN HER ARMS. (*After Steller.*)

"There are four principal methods of capturing the Sea Otter, namely, by *surf-shooting*, by *spearing-surrounds*, by *clubbing*, and by *nets*.

"The surf-shooting is the common method, but has only been in vogue among the natives a short time. The young men have nearly all been supplied with rifles, with which they patrol the shores of the island and inlets, and whenever a Sea Otter's head is seen in the surf, a thousand yards out even, they fire, the great distance and the noise of the surf preventing the Sea Otter from taking alarm until it is hit; and in nine times out of ten, when it is hit in the head, which is all that is exposed, the shot is fatal, and the hunter waits until the surf brings his quarry in, if it is too rough for him to venture out in his 'bidarkie.' This shooting is kept up now the whole year round.

"The spearing-surround is the orthodox native system of capture, and reflects the highest credit upon them as bold, hardy watermen. A party of fifteen or twenty bidarkies with two men in each, as a rule, all under the control of a chief elected by common consent, start out in pleasant weather, or when it is not too rough, and spread themselves over a long line, slowly paddling over the waters where the Sea Otters are most usually found. When any one of them discovers an Otter asleep, most likely, in the water, he makes a quiet signal, and there is not a word spoken or a paddle splashed while they are on the hunt. He darts towards the animal, but generally the alarm is taken by the sensitive object, which instantly dives before the Aleut can get near enough to throw his spear. The hunter, however, keeps right on, and stops his canoe directly over the spot where the Otter disappeared. The others, taking note of the position, all deploy and scatter in a circle of half a mile wide round the point of departure thus made, and patiently wait for the re-appearance of the Otter, which must take place within fifteen or thirty minutes, for breath; and as soon as this happens the nearest one to it darts forward in the same manner as his predecessor, when all hands shout and throw their spears, to make the animal dive again as quickly as possible, thus giving it scarcely an instant to recover itself. A sentry is placed on its second diving-wake as before, and the circle is drawn anew;

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* Capt. C. M. Scammon, "American Naturalist," Vol. IV., 1870.

and the surprise is often repeated, sometimes for two or three hours, until the Sea Otter, from interrupted respiration, becomes so filled with air or gases that he cannot sink, and becomes at once an easy victim.

"The clubbing is only done in the winter season, and then at infrequent intervals, which occur when tremendous gales of wind from the northward, sweeping down over Saanach, have almost blown themselves out. The natives, the very boldest of them, set out from Saanach, and scud down on the tail of the gale to the far outlying rocks, just sticking out above surf-wash, where they creep up from the leeward to the Sea Otters found there at such times, with their heads stuck into the beds of kelp to avoid the wind. The noise of the gale is greater than that made by the stealthy movements of the hunters, who, armed with a short, heavy, wooden club, dispatch the animals one after another without disturbing the whole body, and in this way two Aleuts, brothers, were known to have slain seventy-eight in less than an hour and a half."

The nets used by the Atka and Attore Aleuts "are from sixteen to eighteen feet long, and six to ten feet wide, with coarse meshes made nowadays of twine, but formerly of sinew. On the kelp-beds these nets are spread out, and the natives withdraw and watch. The Otters come to sleep or rest on these places, and get entangled in the meshes of the nets, seeming to make little or no effort to escape, paralysed, as it were, by fear, and fall in this way easily into the hands of the trappers, who have caught as many as six at one time in one of these small nets, and frequently get three. . . . No injury whatever is done to these frail nets by the Sea Otters, strong animals as they are; only stray Sea Lions destroy them. . . . . The salt water and kelp seem to act as a disinfectant to the net, so that the smell of it does not repel or alarm the shy animal."*

SEA OTTER.

GENERAL RELATIONS OF THE LAND CARNIVORA, RECENT AND FOSSIL.

From very obvious reasons we have been compelled to describe the various forms of Land Carnivora of which we have been able to take account, one by one, beginning with Cats, and ending with the Otters. But the reader will already have discovered that a linear arrangement like this gives no true conception of the relations existing between the various families of which the sub-order is composed, or of the various genera which are included in the families. For cross-relationships of the most puzzling and often complicated description are perpetually turning up: among the Æluroids, for instance, we found Cryptoprocta to be intermediate between Cats and Civets, and yet, if we had followed the order indicated by this relationship, we should have had to ignore the close connection between Cats and Hyænas, and that between Hyænas and Civets, through the intermediation of the Aard Wolf.

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* H. W. Elliott, quoted by Coues, "Fur-bearing Animals."

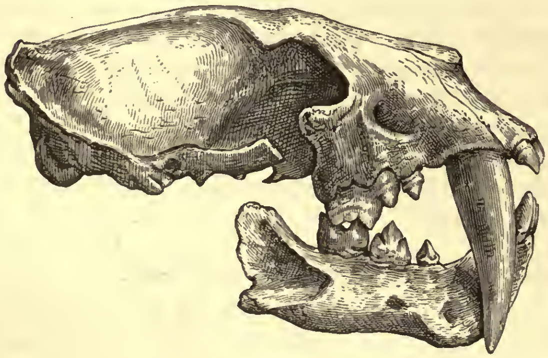
It is necessary, then, to devise some method of writing down the names of the families, other than that of placing them one under the other, if we are to get anything like a clear notion of their mutual relationships. The method adopted by Professor Flower is perhaps the most convenient, and following him, we arrange the groups thus :—

Felidæ. Hyænidæ. Ursidæ.
Cryptoproctidæ. Protelidæ. Canidæ. Procyonidæ. Ailuridæ.
Viverridæ. Mustelidæ.

In this scheme we see an expression of the fact that the Dogs (*Canidæ*) form a central group, from which the families of the Æluroidea—those to the left—diverge in one direction, and the families of the Arctoidea—those to the right—in the other direction. The Civets (*Viverridæ*) and the Weasel family (*Mustelidæ*), being the least modified of the Æluroid and Arctoid sections respectively, are placed at the bottom of the table, the Cats (*Felidæ*) and Bears (*Ursidæ*), being the most modified, are placed at the top. The two latter families, again, are placed at opposite extremities of the table, as far from one another as possible, to indicate the great gap which separates the digitigrade, short-skulled, active, carnivorous Cats, from the plantigrade, long-skulled, clumsy, herbivorous Bears. To be quite accurate, such a scheme should take account not merely of families, but of genera : in our table, for instance, there is nothing to show the immense amount of specialisation undergone by one section of the *Mustelidæ*—the Otters—to fit them for aquatic life ; but such a detailed arrangement is quite beyond the scope of the present work.

In considering the chief forms of Carnivora existing at the present day, we have by no means exhausted this varied and interesting group, for a number of its members, the forerunners of those now living, have vanished from the face of the earth, and are known to us only by their bones, which we find here and there entombed in the strata of which the crust of our earth is composed.

In the newest, that is the most recently deposited, set of strata, those which together form the beds of the Pleistocene period, we find a very curious change in the flesh-eaters inhabiting England. Instead of having nothing but Wild Cats, Wolves, and Bears—the only wild beasts known to have existed in the historical period—we have the enormous Cave Lion (*Felis spelæa*), besides the Cave Bear (*Ursus spelæus*), and the Cave Hyæna (*Hyæna spelæa*), the last being merely a variety of the Spotted Hyæna (*Hyæna crocuta*) of the present day. The presence of the first and last of these would seem to indicate that the climate of Britain was warmer in the Pleistocene period than it now is; but the presence of the Glutton, as well as of some non-carnivorous Arctic animals, tends to the other opinion, namely, that the climate of England was sub-Arctic. Very probably the Cave Lion and Hyæna were provided with thick woolly fur, and so, like the Mantchurian Tiger and the Northern Leopard (see pp. 34 and 42), enabled to bear a degree of cold experienced by but few of their relatives at the present day.



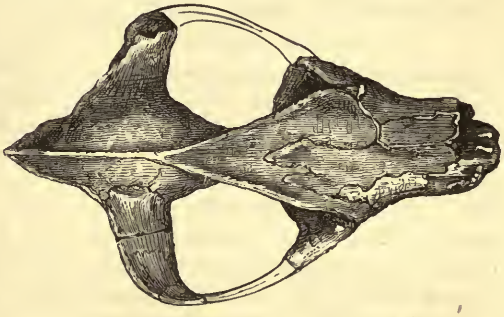
SKULL OF MACHÆRODUS. (*After Gaudry.*)

In beds of the same age in South America is found a true Cheetah, a species now confined to the Old World. But the most wonderful animal belonging to this period is the great Sabre-toothed Tiger (*Machærodus*), a gigantic animal, with canines six or eight inches long, and jagged at their edges like a very fine saw. It would almost seem as if Dame Nature, in producing this terrible beast, had actually got to the end of her tether in the matter of specialisation for carnivorous habits ; the canines of Machærodus were so long that he must have had some difficulty in opening his mouth sufficiently wide to take in anything large, and thus it would seem that he actually overshot the limit of perfection, and died of over-specialisation. The canines of the Sabre-toothed Tiger are, however, not its only peculiarity: there is one less premolar on each side of the upper jaw than in the modern members of the Cat family, so that the total number of teeth is reduced to twenty-eight,* the smallest number found in any of the Carnivora.

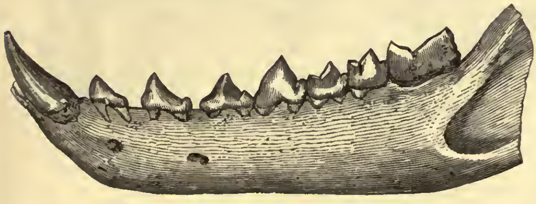
On descending to the rocks of Pliocene age, we find, amongst many forms existing at the present day, an animal called *Galecynus*, about the size of the Fox, and possessing many characters, in its teeth, limbs, &c., intermediate between those of the Dogs and those of the Civets. Another genus, *Hyænarctos*, is almost exactly half-way between Dogs and Bears; its molars have less of a cutting character than a Dog's, and less of a grinding character than a Bear's, and its front premolars, though much smaller than a Dog's, do not fall out altogether, as in the Bear.

In the Pliocene, or Late Miocene strata, remains have been found of many existing genera, such as Cats, Civets, Hyænas, Dogs, Weasels, Ratels, and Otters; but amongst these are several genera not occurring in any of the more recent strata, and all, or nearly all, tending to bridge over the gaps which separate existing families from one another. For instance, a perfect gradation between the Hyænas and Civets is afforded by two genera, *Hyænictis* and *Ictitherium;* while *Lutrictis* shows affinities both with Civets and Otters, *Hemicyon* with Dogs and Gluttons, and *Dinictis* with Cats and Weasels. Another very interesting genus, *Promephitis*, belongs undoubtedly to the Weasel family, but is intermediate between its three sub-families, the Weasels proper, Badgers, and Otters. *Simocyon*, again, an animal about the size of a Leopard, is described as having the canines of a Cat, the molars of a Dog, and jaws shaped like those of a Bear. Lastly, *Amphicyon* is a large plantigrade animal, Bear-like for the most part, but with trenchant molars, like a Dog's, and having a small additional or third molar on each side of the lower jaw, the number of its teeth being thus brought up to that which may be called the typical Mammalian number, namely, forty-four.†

In the Eocene, or Lower Tertiary, still more remarkable forms occur, along with several genera existing at the present day, such as the Cryptoprocta, Civet, Dog, and Marten, all of which are found in the upper or more recent strata of the Eocene formation. But lower down the genus *Cynodon* also connects Dogs with Civets; and in the very lowest beds occurs a large plantigrade animal (*Arctocyon*), with a very small brain-case, wide jugal arches, a complete set of forty-four teeth, and altogether of a generalised character. In the Eocene of North America, *Limnocyon* and *Prototomus* occur low down, and in the Middle Eocene a form as large as a Lion has been discovered, to which the name *Limnofelis* has been given, and also *Orocyon*, and some allies of the *Hyænodon*.


SKULL OF ARCTOCYON. (*After Gaudry.*)

But we have not yet learned all that Palæontology can teach us about the history of the Carnivora. In the Eocene and Lower Miocene beds are found animals referred to the genera *Hyænodon*, *Pterodon*, *Palæonictis*, and *Proviverra*, which, not content with trespassing on the boundaries between existing families, actually wander outside the Carnivorous order altogether, and approach so nearly to the Marsupials (Kangaroos, Opossums, &c.) that many competent anatomists have proposed to place them in the latter group. The premolars and molars in these extinct animals have sharp cusps, and


LOWER JAW OF HYÆNODON. (*After Gaudry.*)

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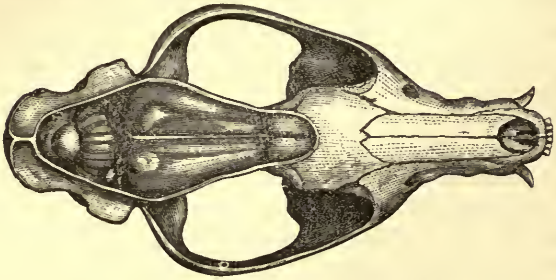
* The dental formula is—Incisors, $\frac{3-3}{3-3}$; canines, $\frac{1-1}{1-1}$; premolars, $\frac{2-2}{2-2}$; molars, $\frac{1-1}{1-1}$ = 28.

† The dental formula is—Incisors, $\frac{3-3}{3-3}$; canines, $\frac{1-1}{1-1}$; premolars, $\frac{4-4}{4-4}$; molars, $\frac{3-3}{3-3}$ = 44.

increase gradually in size from before backwards; so that, of the whole grinding series, the first premolar is the smallest, and the last molar the largest. Now we have seen that the rule among existing Carnivora is for the last molar to be a small tooth, and for the largest of the set to be the fourth premolar in the upper jaw, and the first molar in the lower jaw. On the other hand, the regular increase in size is very characteristic of the flesh-eating Marsupials, amongst which the Thylacine, or so-called Tasmanian Wolf, shows a considerable resemblance, as to its teeth, to *Hyænodon* and *Pterodon*, while *Palæonictis* and *Proviverra* are more nearly allied to the Opossums and to the Dasyure, or Tasmanian Devil. The brain-case in these forms was very small, and a cast of the interior of the skull of Proviverra, figured by M. Gaudry,* shows that the brain must have had an extremely low character.

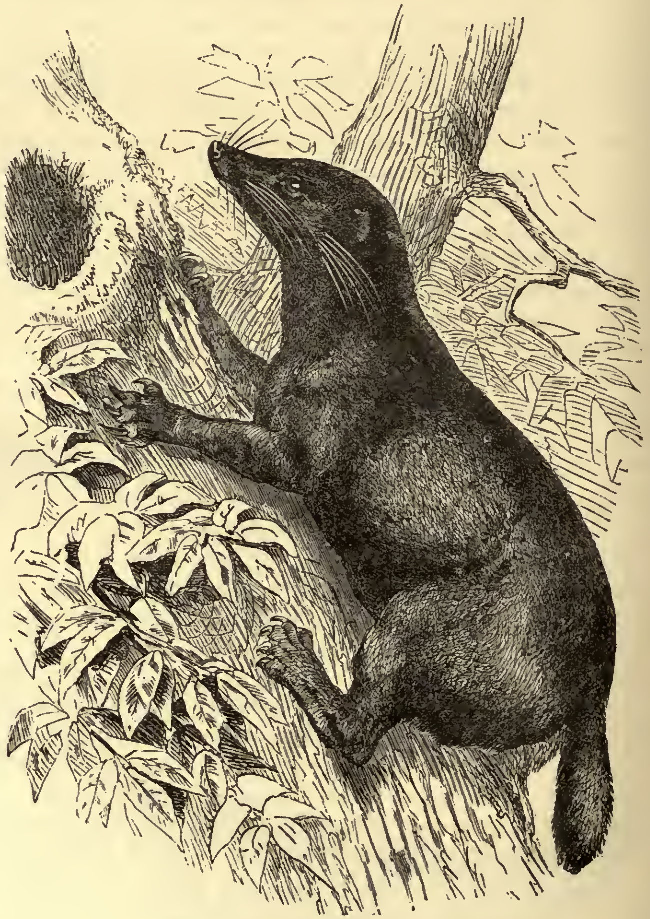


SKULL OF PROVIVERRA. (*After Gaudry.*)
The roof of the skull is supposed to be cut away to show the form of the brain, as deduced from a natural cast of the interior of the skull.

We thus see that a considerable number of the existing genera of Carnivora took their origin in the Eocene epoch, where they co-existed with creatures curiously intermediate between the various existing families, and with others intermediate between Carnivora and Marsupials. In the rocks of the Secondary period (chalk, oolite, lias, &c.), none of the Carnivora have as yet appeared, and only Marsupial remains are found.

APPENDIX TO CHAPTER VI.
(VIVERRIDÆ, CIVET FAMILY.)
THE CYNOGALE.†

Although in all essential respects a true Viverrine, the Cynogale, or Mampalon, differs very considerably in external appearance from all the members of the family we have hitherto considered. It has none of a Civet's lithe and slender appearance, but is stout and plump. Its tail is very short, not more than six inches long, or a quarter the length of the head and body, which together attain a length of about two feet. The snout is long and pointed, the muzzle bald, and the ears very short; the whiskers are decidedly extensive in their development, for besides the usual hairs on the snout, there are two large bundles of long bristles on the cheeks, one a little in front of and below the eye, the other in front of the ear. The limbs are short and stout, and the digits are five in number, slightly



CYNOGALE.

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* "Les Enchaînements du Monde animal, dans les temps géologiques." Paris, 1878.

† *Cynogale Bennettii.*

webbed at the base, and provided with short, retractile claws. The close thick fur is of a yellowish-brown colour, lighter on the under side of the head, and over the eyes, and darker on the legs. The mode of progression is nearly plantigrade.

There is not much known of the habits of the Cynogale, except that it frequents the neighbourhood of water, and is also a good climber. It is found in the island of Borneo.

THE CYNICTIS.*

This animal, a near relative of the Ichneumons, is found in South Africa, where it is represented by three species. The head and body attain a length of about half a yard; the tail of about a foot. The pelage is smooth, of a reddish colour, darker on the head and limbs; the tail is bushy, of a greyish colour, and tipped with white. There are five toes on the fore foot, three on the hind foot.

MANGUE.

THE MANGUE.†

The Crossarchus, Mangue, or Kusimanse, presents a good deal of resemblance to the Cynogale, but differs from it in having rough fur and a comparatively long tail. It is also a much smaller animal, not exceeding fourteen or fifteen inches in length from snout to root of tail, which latter appendage is about eight inches in length. The body is thick and stout; the fur brown, becoming lighter on the head; the ears are short, and the snout is long and flexible, projecting some distance beyond the mouth, somewhat like that of the Coati. The secretion of the tail glands is very fetid.

The single species of Crossarchus is found in tropical Africa. Very little is known of its habits in a wild state; in captivity it soon becomes tame, and seems to prefer animal to vegetable food.

THE SURICATE.‡

This is a South African species, and, as in the case of the last two forms, little or nothing is known of its habits in a state of nature. It is about the size of the Crossarchus, the body and head attaining a length of about thirteen, the tail of about six inches. The body is of a greyish-brown colour, marked along the back with yellowish-grey transverse stripes. There is a black patch round the eye, bordered by a lighter area, and the ears and the end of the tail are also black. As in the Cynogale, the head is rounded, the snout long, and the ears short. The legs are much longer than in either of the preceding genera, and the feet are distinguished by being provided with only four instead of five toes. The claws are very long and curved, and, as might be judged from this, the animal is addicted to burrowing.

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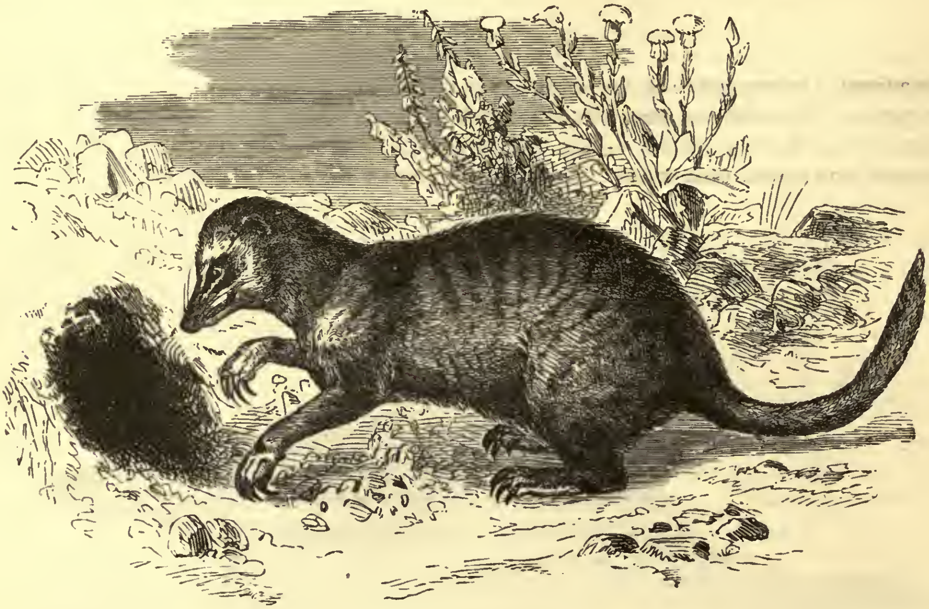
* *Cynictis penicillata.* † *Crossarchus obscurus.* ‡ *Suricata zenick.*



SURICATE.

There are several of these pretty little animals in the Zoological Gardens, where their innocent faces and quiet ways distinguish them very favourably from their relatives, the Ichneumons, which are perpetually quarrelling in the most outrageous fashion.

WILLIAM KITCHEN PARKER.
THOMAS JEFFERY PARKER.

THE AQUATIC OR MARINE CARNIVORA.

CHAPTER I.

INTRODUCTION—THE WALRUS, OR MORSE.

Pinnipedia distinctly Aquatic—The Three Families—Their Common Characteristics—Skeleton—Mobility of Figure—Feet—Dentition—Skull—Tongue—Stomach—Intestine—Peculiar Disposition of Blood-vessels of Liver—Lungs—Sense of Smell—Larynx—Brain—Sense of Hearing—The Walrus Family—Characteristics—THE WALRUS, OR MORSE—Geographical Distribution—Fossil Forms—Weight—Size—Appearance in Old Age—Mode of Walk—Habits—On Guard—In the Water—Attacked—Tusks—Dentition of the Young—Uses of the Tusks—Food—Long Fasts—Story of "Jamie," a Tame Walrus—The Young—Maternal Affection—Massacre—Walrus as an Article of Diet.

THE Walrus, the Sea Lions, and the Seals, collectively termed the Pinnipedia,[*] or by some Pinnigrada,[†] constitute the second well-marked group or sub-order of the Carnivora. They are truly inhabitants of the high seas, the land being to them only an occasional resort, when procreation or other causes induce short visits, or temporary residence thereupon. In the previous chapters it has been noted that certain of the so-called Land Carnivora, the White Polar Bear, or the Common Otter (*Lutra*), for example, take freely to the water, and even subsist on finny and other prey derived therefrom, but nevertheless, as a rule, such Carnivora only peradventure are semi-aquatic. The one notable instance to the contrary is the Sea Otter (*Enhydra*), an animal seldom seen on land, though rarely met with far from rocky reefs and islets. Besides mere habit, the Polar Bears and Otters in some points of their organisation—particularly the conformation of the skull of the first, and webbed toes and abundant under-fur in the two last—show a partial gradation and tendency of structure towards their strictly marine brethren, the Seal tribe.

The group of the Pinnipedia is one in which considerable interest is centred, and this for several reasons. Their history, as handed down by classical lore, has a shade of the mythical, and well shows how fable has become engrafted on fact. Within the last two centuries their pursuit has been brimful of incident and adventure. As articles of commerce, the oil and the furs of certain kinds of the Seal tribe are of immense importance; whilst the mere hides of all, besides the Walrus tusks, are commodities of great value. Indeed, to the natives of the Arctic regions, Seals are indispensable as a means of every-day existence. But to the naturalist the fact of their being Carnivores peculiarly adapted to an aquatic life, and the study of their habits generally, are subjects of intense interest.

Moreover, the gradual, in some instances sudden, diminution of Seal life at the hand of man, points to a possible early period of their extinction, as in the case of the Whales and Manatee tribes, and warns, like the Roman story of the Sybilline books, that if we would read the history of the past, the knowledge must be culled ere the records are swept beyond recall.

The three families of the Pinnipedia are denominated in technical language the Trichechidæ,[‡] the Otariidæ,[§] and the Phocidæ.[||] The first has but one living representative, the Walrus, or Morse; the second contains the so-called Sea Lions and Sea Bears, more distinctively known as Eared Seals; in the third family are ranged the ordinary Seals, contra-distinguished as Earless Seals. Sufficiently different among themselves in general aspects and habits, as to be recognised at a glance, the three families, nevertheless, have characteristic features common to all, wherefrom the sub-order has received its name. Their toes are united nearly throughout by a web of membrane, as in a duck's foot, which converts the paws into broad, fin-like organs (the flippers), well adapted for swimming purposes. This feather-footed, pinnipedal condition is associated with a shortening of the upper segments of the limbs, and such peculiar attachment especially of the hind-legs as to leave little more than the feet free. The body is long, usually ample and fleshy at the neck and shoulders, but narrows taperingly behind towards the rump. The head is either flattish and elongated or more or less rounded, but in all cases relatively small to the bulk of the animal. External ears are absent save in the Otary family, which possess a diminutive, conical, or pear-shaped ear-conch. The eyes are full, and often expressive, though usually on land bearing a drowsy look, from their vision being adapted for a watery medium.

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[*] *Pinna*, a fin; *pes*, a foot.

[†] *Pinna*, a fin; *gradus*, a step.

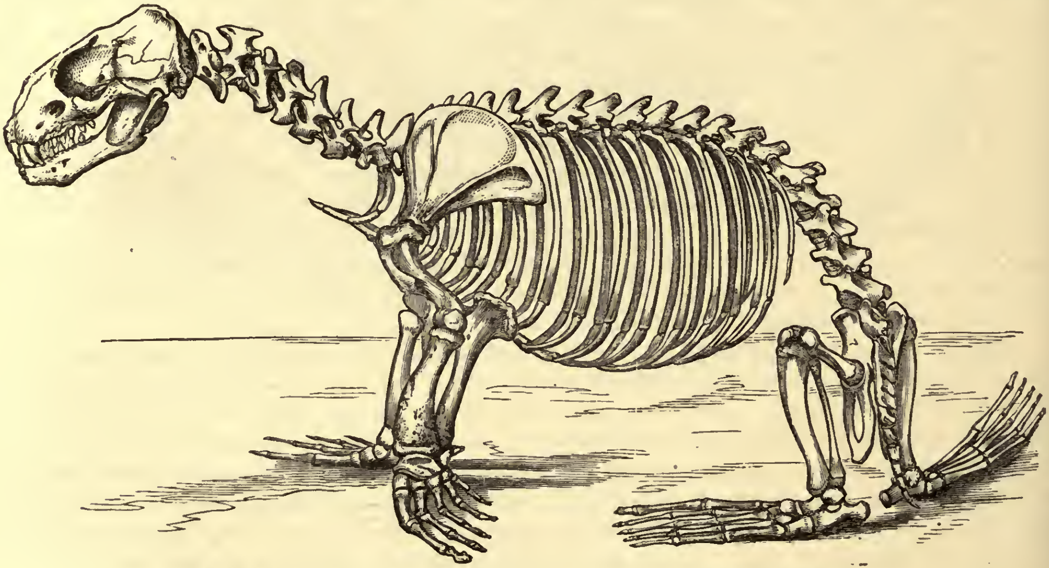
[‡] From the Greek, θρίξ, a hair, and ἔχω, I have.

[§] From the Greek, οὖς, ὠτός, an ear

[||] From the Greek, φώκη, a seal.

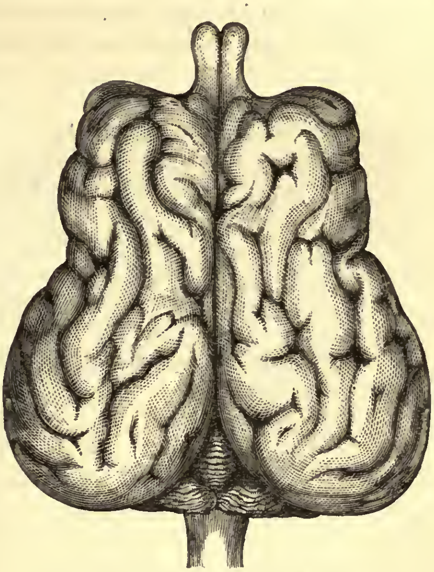
Unless as the merest rudiment, there are no eyelashes or eyebrows. The muzzle is dog-like, but with long, stiff, though exceedingly mobile moustaches. In the Walrus, however, chiefly on account of its huge tusks, this part of the face is immensely dilated, fleshy, and covered with great pliable bristles, like knitting-needles in calibre; these latter and tusks being adaptations suited to the animal's mode of feeding. The skin of the body fits loosely, and there is a thick layer of oily fat beneath, its amount depending on general condition, season, and sex. The hairy covering is of two sorts, a stouter, coarser, and at the roots a much shorter, softer kind. As it appears ordinarily, the hair seems uniform and short, and when wetted it clings close to the skin, so that the surface then is smooth and polished, becoming rougher as it dries. Now, it is the soft under-wool, which is in great abundance in some of the Sea Lions only, that constitutes the fur of commerce.

In the skeleton it is to the amount of cartilage between the bones, along with the gristly rods attaching the ribs to the back and breast-bones, that the extraordinary mobility of figure on land, and easy motions of swimming in the water, which belong *par excellence* to the Marine Carnivora, are due. Add to this that the hip-bones are narrow and remarkably compressed, the thigh-bones excessively short, the shank-bones long and tied in behind, while great hind-flippers, like double oars rearwards, drive or steer with sculling sweep. The bones of the fore-limb and its modified foot altogether are strong, and remarkably so in the powerful-swimming Sea Lions. All four feet have excessively long toes, the thumb-bones being longest, the fingers lessening to the little toes; in the hind-foot the three middle toes are shorter than the two outer ones. There are tiny nails on each toe at the bone ends, beyond which is a flat spatula-shaped cartilage, of excessive length in the Otary family. The webbed flat feet are thus altogether very peculiar, and when used the entire sole, even including wrist and ankle-bones, is laid flat on the ground, so that two families of the Pinnipedia are really more plantigrade than the Bears. The Common Seals, or Phocidæ, however, never use the hind-feet on land, and the fore-feet but sparingly, while their nails are more claw-like than in their marine congeners. In none of the Seal tribe, though, are the nails or claws retractile, as previously has been shown (p. 12) in the Cat and Lion.

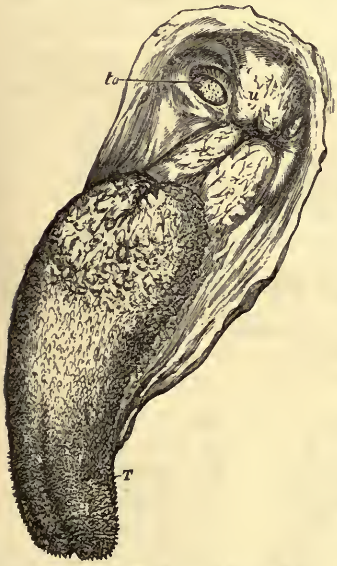


SKELETON OF OTARIA IN THE ATTITUDE OF WALKING. (*Reduced after Murie.*)

The skull in the three families presents modifications partly adapted to their different habits and modes of life, and partly to their race characters. In none, however, do we find the peculiar scissor-like or cutting teeth (see p. 13) of the typical Land Carnivora, but, as in the Bear tribe, the dentition exhibits a diminution in the cutting form of the teeth, and a tendency in some of the creatures to a levelling and conical production of the crown of the molars, while in others these latter show a serrate or saw-like character. For example, in the Walrus all the teeth, save the canines, are short and simple-fanged, the canines themselves, or, as they are more commonly termed in this animal, tusks, being of inordinate length and strength. In the Otariidæ, the canines, though themselves of good size, are small in comparison with those of the Morse tribe, while the incisors and single-rooted molars are more conical and prominent. The dentition of the Phocidæ varies considerably, in some the occasionally double-rooted molars acquiring a tuberculate, in others a saw-like or serrate character, while the incisors are notch-crowned. The bony cavity for the eye is open behind; the facial region is less prominently produced than in some of the feline Carnivora. The region of the brain-pan is relatively full, while the skull, as a whole, is elongated and flat. In youth, the cranium of the Pinnipedia has a predominating brain area, and the entire bony surface is smooth and featureless. As age advances, however, in certain of the genera at least, the relation of parts changes, and the face acquires prominence, while great bony crests arise on the summit and back of the head. The tongue does not possess the spines met with in the Cat tribe, though the surface is roughish. In the Seals, but not in the Walrus, the tip is slightly cleft. The stomach is single-chambered. The intestine is considerably longer than in the Felidæ, averaging fifteen times the length of the body, or thereabouts. The glands of the internal coat in some of the tribe are very extensive, and co-ordinate with the excessively rapid digestion.



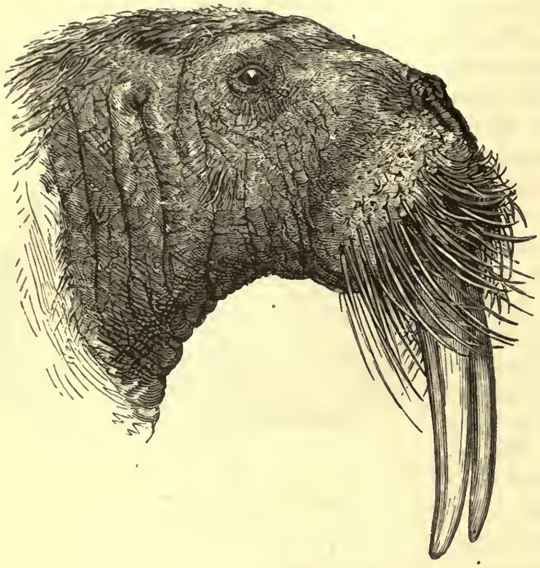
UPPER SURFACE OF BRAIN OF OTARIA. (*After Murie.*)



TONGUE AND BACK PARTS OF MOUTH OF OTARIA. (*Reduced after Murie.*) *to*, Right Tonsil; *u*, Uvula, or Curtain; *T*, Tongue.

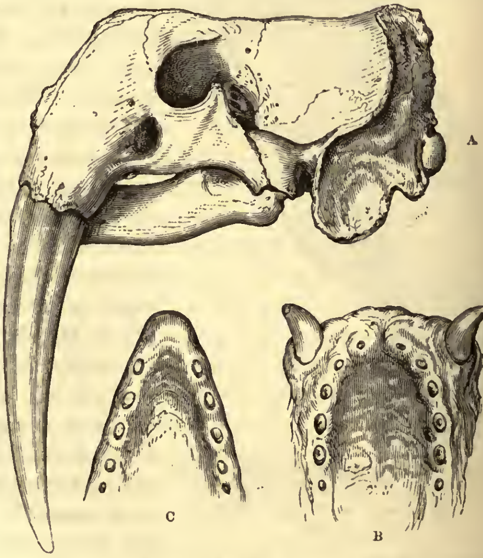
A curious point in connection with the veins entering the liver is their enormous dilatation. This, by some writers, has been regarded as the means whereby the animal is enabled to remain submerged, the blood being held in these reservoirs instead of passing on towards the heart and lungs to be aërated. But whether this peculiar disposition of the blood-vessels is necessarily connected with diving powers, up to the present time has not been satisfactorily decided. Whatsoever the relation between structure and habit in this respect, it has been observed that the staying-power of the Seal tribe under water increases from youth to age. In the Pinnipedia, the lungs, relatively, are capacious, the animal rising to breathe air at intervals from ten minutes to half an hour or more, when at the surface taking a long and deep inspiration. The nostrils are under the influence of strong fleshy bundles, which firmly compress the orifices when below water. Their sense of smell is well developed, and the larynx simple. The brain in all is not only large, but far surpasses in volume and in amount of convolutions that of the Land Carnivora as a whole. Their docility and intelligence, especially when young, are often remarkable. The voice is plaintive or bellowing, but wanting the great compass and strength of the Felidæ. The nerves supplying the organs of smell, sight, and hearing are large, and the last is most unusually acute. Indeed, it is possibly to hearing more than to the other senses that the Seal tribe are dependent for their safety and living. The facts of sound readily travelling under water, of solid ice being also a good conductor, and of the quietness of the frozen regions, all tend to render this faculty of the highest service, nay, a necessity, to the creatures possessing it. Particularly is the faculty of hearing essential when the Pinniped goes on land, for in the rarer medium of the air its vision is defective, the construction of the lens, &c., being that best fitted for sight under water.

I.—THE WALRUS FAMILY (TRICHECHIDÆ).



HEAD OF WALRUS. (*Modified after Murie.*)

This family in some points resembles the Eared Seals, or Otaries, and in others approaches the Earless Seals, or Phocidæ. The characters of the family are mainly, if not wholly, derived from the Walrus, the only living representative. There are no external ears, but a fair-sized opening indicates the passage. Both sexes, when adult, possess two immense tusks in the upper jaw, quite a notable feature. Along with this, there is full development of the bony parts to accommodate them, and the huge, though abruptly truncated muzzle, is garnished with long and remarkably strong bristly moustaches. The semilunar-shaped nostrils, situated above these, are dilated or powerfully compressed at will, by the thick, fleshy muscles of the upper lip. The eye is smaller than in the Otariidæ and Phocidæ. The body, especially its hinder part, is also heavier. The tail seems absent, though, in reality, nearly reaching to the heels, but a broad flap of skin stretches across from leg to leg, and binding these, hides the tail. The hind limbs appear shorter than in the two neighbouring families, but the above tail-membrane is wider, and allows greater freedom to the legs and feet. The three middle toes are shortest, as is the case with the Common Seals, but not the Otaries. The fore-legs are of intermediate length, strong, stumpy, and although the thumb is biggest, there is a certain equality in the length of the toes. The fore feet, as well as the hind feet, are sufficiently free to be laid flat on the ground. The nails are diminutive, and not claw-like, and the soles of the feet are unusually rough and warty. The tongue is smooth, and not cleft at the tip. The dental series is as follows:—Incisors, $\frac{1-1}{0\quad 0}$; canines, $\frac{1-1}{1-1}$; premolars, $\frac{3-3}{3-3}$; molars, $\frac{2-2}{1-1}$, $= 24$. The tusks, or upper canines, lie outside and almost in front of the dental arch. The incisor and grinding teeth are uncommonly alike, being short, cylindrical, and obliquely truncated at their crowns. The teeth alone are very distinctive of this family, and modified for uses and a diet *sui generis*. There is no such development of a thick coating of under-fur, as in certain of the Otary family, the root hairs being sparse, and the larger sort softer, shaggier, and not so close pressed as in the Seals.



SKULL AND DENTITION OF WALRUS. (*After De Blainville and Murie.*)
A, Skull of Old Animal; B, Palate and Dentition of Young; C, Lower Jaw and Dentition of Young.

THE WALRUS, OR MORSE.*—So far as looks are concerned, scarcely a more uninviting fellow can be conceived than this animal, which the Greenlanders and Eskimo call "Awŭk," from its peculiar guttural cry. It is better known among our own countrymen as the Sea Horse, though naturalists more frequently prefer Walrus, or Morse, words respectively modified derivatives from the old Norse and Lapp languages. Its present range is a narrow belt girding Labrador, Hudson's and Baffin's Bays, and skirting the East Greenland coast towards Spitzbergen and Nova Zembla, and still farther stretching on to Behring's Strait and the islands off Alaska. Certain writers are inclined to regard the animal found in the North Pacific as a different species from that inhabiting the North Atlantic seas; but on this head no very justifiable evidence is yet offered. Meantime, its geographical distribution, briefly defined, is the Arctic Circle. Here, thinned by its hereditary enemy, the Polar Bear on the land side, and stricken down wholesale by man seawards, the day of its extermination seems not far distant. The living Walrus, indeed, presents to us a solitary example of a family once more numerous and widespread, and doubtless coincident with a period when climate was different from that now existing where their fossil remains have been discovered. In the deposits of Virginia, on the American Continent, in the Suffolk crag, and possibly in contemporaneous beds around the neighbourhood of Antwerp, bones of Walruses allied to the present northern form have been dug up. But others, moreover, have been found which, from greater size and characteristic peculiarities, evidently belonged to at least two genera (*Trichechodon* and *Alachtherium*) distinct from the Arctic animal. Thus, by degrees, the more massive representatives of the family Trichechidæ have died out, while the last of the descendants visibly diminish amongst the bergs of their secluded, ice-bound home.

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* *Trichechus rosmarus.*

The Walrus of the present day is a creature which attains large dimensions. Elliott mentions a great fellow, shot in the Behring Sea, nearly 13 feet long, and with a girth of 14 feet; and he estimates the gross weight of an ordinary full-grown male at 2,000 lbs. Well have some likened the hide, which is of a tawny brown colour, to a tough, flexible coat of mail, which harpoon and even bullets penetrate with difficulty. In old age these creatures do not only become obese, shapeless masses, but their gnarled hide, scarred by tusk-marks, bullet, or harpoon wounds, gets blotchy, pustular, and hairless. This, with small, fierce, bloodshot eye, in marked contrast with that of the Seals, and formidable pair of tusks, gives it a ferocious and demoniacal look.

The unusually flattened head seems disproportionately small to the great neck and sack-like body, the tusks and moustaches being all in all either in profile or front view. Their movement on land is very awkward and droll. With high-set shoulders and low hind-quarters, and squat limbs to their heavy body, the fore feet are successively thrust flat forwards from the wrist, each followed by a hitch and swing of the hind foot, as from a pivot on the heel, ending in a sudden sort of jerk or check. Thus they straddle in a clumsy, indolent way along the rough ice, in emergency exerting themselves into a kind of hobbling canter.

This ungainly creature, though so repellent in features, is in reality quiet and inoffensive, unless attacked or roused in love-time, when woe betide those who measure his strength, especially if he reach his native watery element. They are very gregarious, seldom being met with singly, but often in herds from a dozen to several hundreds, as Captain Cook long ago observed. They crowd up from the water on to the rocks or ice one after the other, grunting and bellowing. The first arrived is no sooner composed in sleeping trim, than a second comes prodding and poking with its blunt tusks, forcing room for itself, while the first is urged farther from the water; the second in turn is similarly treated by the third; and so on, until numbers will lie packed close, heads and tails resting against and on each other, in the most convenient and friendly manner possible. There they sleep and snore to their hearts' content, but nevertheless, according to Elliott, keep guard in a singular fashion. Some one would seem to disturb another; then this fellow would raise his head listlessly, give a grunt and a poke to his nearest companion, who would rouse up a few minutes, also grunt, and pass the watchword to his neighbour, and so on through the herd, this disturbance always keeping some few on the alert. Danger announced, they scuttle pell-mell and topsy-turvy into the water.

Once in the sea, their sluggish deportment vanishes, and activity is the order of the day. Curiosity aroused, or attack threatened, as Lamont remarks, the herd keep near each other. One moment a crowd of grisly heads and long, gleaming white tusks are above the waves; then follow snorting and hasty breathing; immediately thereafter, a host of brown hemispherical backs, followed by pairs of flourishing hind-flippers, and the lot have dived, again to appear at an interval, and the same performance be gone through. If one gets injured, or a young one is in danger, the host of Walruses close round the boat, grunting, rearing, and snorting, and if their wrath be roused, they rush simultaneously to the fight, and attack the boat. When a young Sea Horse is wounded, the parent becomes desperate, and fearlessly exposes herself, or seizes the youngster under her fore-flipper, and makes off, or defends herself and progeny to the death. There is no security to the hunter on the ice, which the animal in its fury will break through, even when six inches thick.

The tusks vary from eight inches to two feet long, and may weigh from five to fifteen pounds; in the males they are generally supposed to be thicker and more divergent. These teeth continuously grow, and, as they wear away, their interior becomes filled with tooth bone. In the young Walrus, there appears to be more teeth than in the adult; but these, as Professor Flower has shown, are exceedingly diminutive denticles, and may or may not remain through life. The first tooth of the molar series in the upper jaw, as in the Dog and other Carnivora, has no predecessor; but the second and third are preceded by milk teeth. In the lower jaw there are three milk teeth.

The formidable canines, when employed as offensive weapons (Lamont notes), not only are used downwards, but by a quick turn of the neck the animal strikes upwards and sideways with equal dexterity. Again, in raising the body out of the water on to the ice-floe after the first jerk forwards, the tusks are dug into the ice with terrific force, and thus the body is hauled on till footing is gained. Broken tusks are by no means rare. But the most important function performed by the tusks is as instruments for procuring food. A part of its time is spent by the Morse on banks and among shoal water, where lie buried in the mud shell-fish in abundance. Certain kinds of Mussels and Cockles are here dug up by the tusks and gulped, often shells and all; but occasionally it swallows Shrimps, Star-fish, and marine worms. Dr. Robert Brown states that whenever killed near a Whale's carcass, the stomach of the Walrus was invariably found crammed with the Whale-flesh. Some say they eat sea-weeds; but the young animal possessed by the Zoological Society, though tried by Mr. Bartlett, refused these, but greedily took Mussels, Whelks, Clams, and the stomachs and intestines and other soft part of fishes cut small. This said young one could not swallow anything larger than a walnut, and from the way in which it used its mouth bristles, in brushing backwards and forwards the food and sucking everything through them, their use as a sieve was very manifest.

Whatsoever their diet they thrive on it, and store up much fat, though less proportionally than Seals. Like some of the Sea Lions, they have the curious habit of swallowing stones, the economy of which is imperfectly understood. But there can be no doubt of the fact, or of another equally strange, that of their protracted fasts. During the autumn months the Sea Horses will muster in force on land, and quite lethargic there doze for days or weeks without tasting food, thus recalling the hibernation of the Bear tribe. The Walrus is infested with skin-parasites and intestinal-worms, and the pebble-swallowing habit is supposed to relieve the irritation of the latter.

Not unfrequently a troop will be found sleeping bolt upright in the water, and so soundly that a boat can approach close to them before they awake. They can remain under water, some say an hour, before requiring to take breath, but the length of time doubtless depends on circumstances; and ordinarily, or when suddenly disturbed, barely a third of that time.

The brain is largely developed, and has many sinuosities, so that in comparison with the Dog or Cat tribes the Walrus ought to possess considerable intelligence. Acts displaying this quality, however, are only sparingly manifested in the young where domestication has been attempted.

A surgeon who accompanied one of the Dundee sealers relates how a juvenile Walrus, being captured, became in a few days quite at home, and a general favourite among the crew. It quickly formed a friendship with an Eskimo Dog which was on board. They ate out of the same dish, although "Jamie," the Walrus, took good care always to secure the larger share. Whenever the Dog retired to his barrel to sleep, "Jamie" bundled his own fat carcass right on the top of him, and as doggie rebelled against such an unwieldly bedfellow it usually ended in "Jamie" having it all to himself. The latter ate blubber, beef, pork, and almost everything given him, but his favourite dish was pea-soup. Into this he would plunge his face, which procedure left him a most comical countenance. He seemed to know his name well, for even if fast asleep the instant any one cried out "Jamie!" he would rouse up, gaze anxiously about, grunt, grunting in reply. But the most remarkable trait in his character was an intense hatred of solitude. When alone on deck he appeared a picture of misery, grunting and endeavouring to make his way down "'tween deck" after the men; and on more than one occasion precipitated himself, to his peril, plump down the main hatchway, a height of about nine feet. If the cabin-door were open he at once waddled in, laid himself before the stove, and went to sleep; but if the cabin were empty he would not remain a moment. Nothing made him so angry as to shake a piece of paper in his face, or to run suddenly away after caressing him; he then followed with open mouth in a great passion. When a Whale had been killed, and the ship's crew busy on deck, "Jamie" was in his glory in the very midst of the men covered with grease and oil. At these times he was a perfect nuisance, hindering the men in their duties by continually poking his head first between one seaman's legs and then another's, and so on, meantime running a chance of being cut down in the "flensing" operations. He evinced no particular attachment to any one individual on board, liking all equally from cabin-boy to captain. But he knew full well when he did anything wrong; for if a rope's-end were shown him in a threatening manner, "Jamie" instantly would slink off, furtively casting a look over his shoulder to see if he were followed. After being on board four months he fell ill and died. The expression of this creature's countenance during his sickness was indicative of a great desire for sympathy from any one who came near. He took his medicine to the last, and when his remains were committed to the deep, regret was felt by all on board.

WALRUSES ON THE ICE.

The Walrus, unlike the Sea Lions, is believed to be monogamous. It is known, however, that in the islands of Behring's Strait the female gives birth at nine months to a single young one, usually on the ice-floes. The Seals show a remarkable change in the colour of their coat at different periods of their life; but the young Walrus resembles its parents, though it has no tusks, these not protruding to any great extent for two years after its birth. The young evidently suckle their mother up to the period just mentioned, and this seems necessary, because in the absence of tusks the former are unable to procure the shell-fish and other nourishment by digging. It is quite possible that the attachment and maternal instinct of the helplessness of her great full-grown baby to forage and protect itself in part lead to that abandonment of self conspicuously shown in the heartrending stories of hunters. Whether the Morse has the marked migratory habits which we shall afterwards show obtain among the Seals is uncertain. Circumstances rather tend to prove it to be more permanent in its resorts, though occasionally some individuals must straggle from the herd, since at intervals its occurrence on the British coast has been recorded. Undoubtedly its area is decreasing, and the remaining few seek unfrequented spots in high latitudes less accessible to the sealers. In former days their abundance is historically handed down to us in the fact—as Dr. Rink, Dr. Robert Brown, and others tell us—that the Greenlanders "paid their tribute to the Crusades in the shape of Walrus-tusks, delivered in Bergen in 1327, and their weight is noted in a receipt which is still in existence." But a century ago their numbers were enormous, on the shores of the Gulf of St. Lawrence, sixteen hundred being slaughtered at an onset. Among the first voyagers to Spitzbergen it was no uncommon thing to slay hundreds in a few hours. Lamont tells a story of four boats' crews, in 1852, massacring nine hundred Walruses in a herd of some thousands which they discovered in one of the small islands to the south of Spitzbergen. So greedy were the hunters that half of their spoil had to be left behind, and the rotting carcases afterwards raised such a stench that the animals deserted this previously favourite haunt, a sad lesson of man's inhumanity and savage lust of gain.

The more general opinion is that the flesh of the Walrus is tolerably palatable, and certainly the Eskimo consider the hide a dainty for dessert. The tongue, at least, is excellent, and a favourite dish amongst the whale-fishers and the crews of the various Arctic expeditions. Lamont, dining on stewed Walrus veal, mentions its being slightly insipid, but good eating notwithstanding; the old animal's flesh, however, is by no means so universally admired, although Arctic crews, at a pinch, much prefer it to salt junk.

At one time a considerable trade was devoted to Walrus-hunting, but the diminishment of their numbers has practically reduced it to the lowest ebb. The tusks alone have now any commercial significance, but formerly Walrus hides were used for various purposes, such as machine-bands, carriage-springs, rigging of ships, and the like.

CHAPTER II.

II.—THE SEA LION FAMILY (OTARIIDÆ).

Various Names—Peculiarities of Distribution—Characteristics of the Family—Dentition—Skull—Fossil Remains—Distinction between Fur and Hair Seals—Preparation of the Seal-skin—THE NORTHERN FUR SEAL—History—The Pribyloff Islands—Male, Female, Young—"Hauling-grounds"—Wintering—Males at the Islands in Spring—Desperate Battles for Seaward Positions—Approach of the Females—Struggles for Wives—The Young—Abstinence from Food, Water, and Sleep for more than Two Months—Neutral Ground in the "Rookeries"—Habits of the Young—Food—Annual Slaughter—Estimated Numbers—Mode of Killing—STELLER'S SEA LION—GILLIESPIE'S HAIR SEAL—HOOKER'S SEA BEAR—The Wreck of the *Grafton*—Musgrave's Narrative—Sufferings of the Castaways—Their Experiences among the Sea Bears—THE WHITE-NECKED OTARY—Distribution—Description—"Counsellor Seal"—THE PATAGONIAN SEA LION—Historical Associations—Impetus to the Study of the Family—François Lecomte—Its Docility and Intelligence—Its various Performances—Voracity—Lecomte's Observations—Habits—THE FALKLAND ISLAND FUR SEAL—Habitat—The Hunters' Boats—Driven from their Haunts—Captain Weddell's Observations—Great Wariness and Speed—Size—Habits—THE SOUTH AFRICAN, OR CAPE FUR SEAL—THE NEW ZEALAND FUR SEAL—THE ASH-COLOURED OTARY—Peron's Services to Science.

THE old voyagers have termed, and the present race of sealers know, members of the Otary family by such names as Sea Lion, Sea Leopard, Sea Bear, Sea Wolf, Sea Dog, &c., and these terms have even passed from seamen to science. The Otariidæ, like the Common Seals, are found both in the northern and southern hemispheres, but it is a remarkable fact that the species (some would even say genera) inhabiting the northern and southern regions are perfectly distinct the one from the other. Nay more, the one seems representative of the other. For example, there are a certain number of Fur-bearing Seals, and a certain number of Hair Seals, distributed over a wide area of the Arctic and Antarctic Circles, which, in either case, are spread hither and thither into more temperate latitudes. Indeed, the most recent observations tend to show that these animals are migratory in habit, and frequent certain given localities at regular intervals.

Much confusion for a long time reigned concerning the species of the Sea Lions. This difficulty

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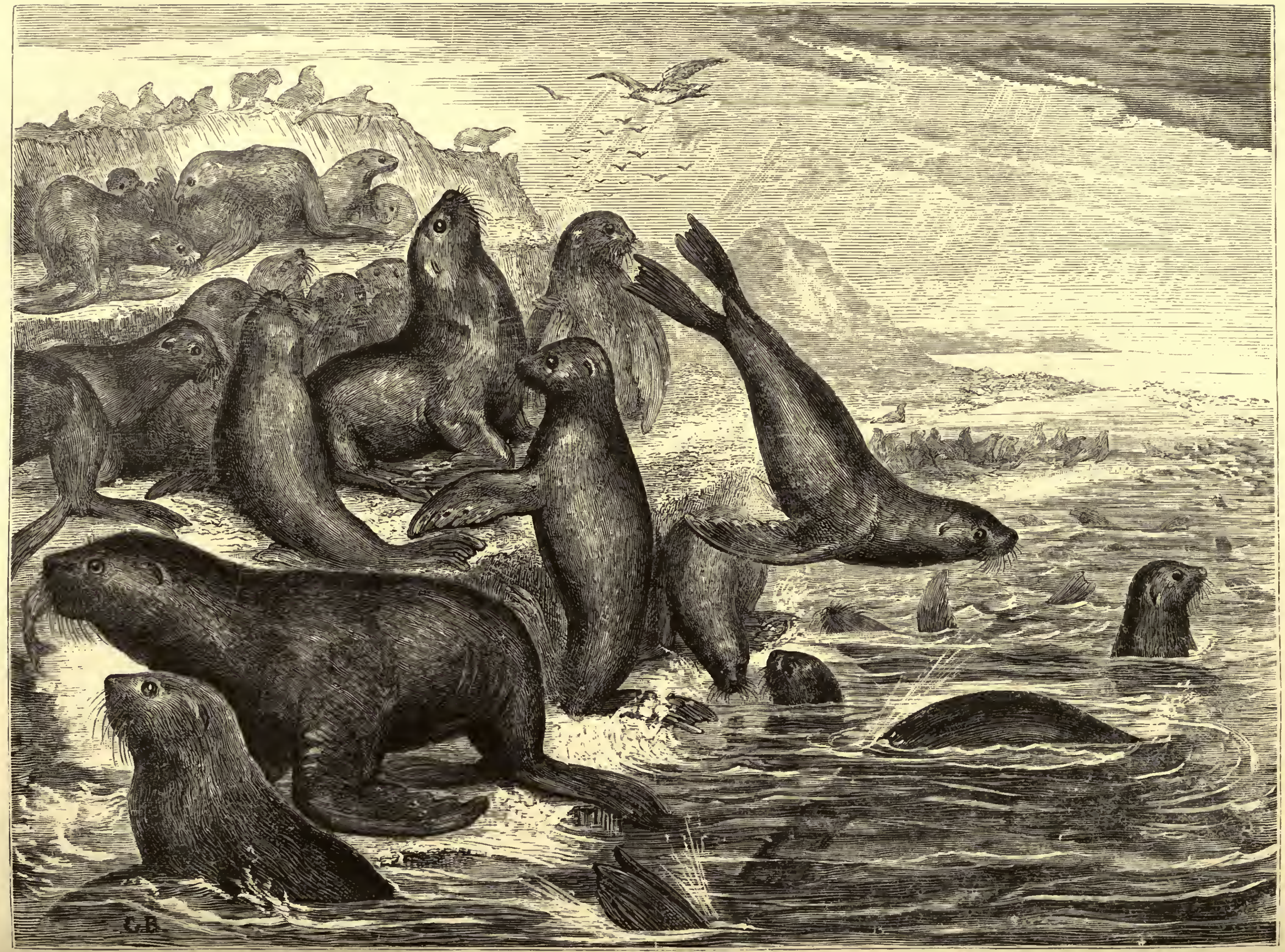
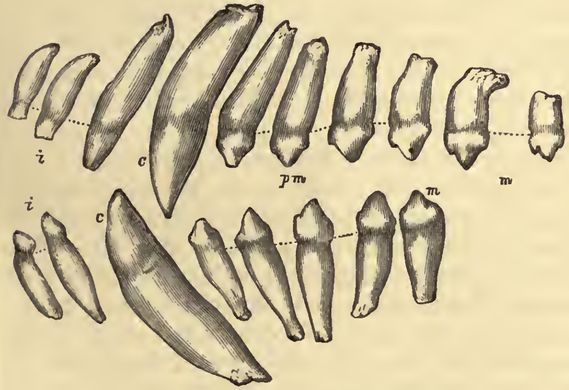


SEA LIONS.

has arisen from several reasons. Sealers have long distinguished the two kinds, namely, Fur Seals and Hair Seals; but among the thousands and thousands of skins annually brought home, little attention was paid to the animal from which the different skins were obtained, other than to its mere market value. While skins, and occasionally skulls or skeletons, found their way into our museums, seldom have these specimens been certified as belonging to one and the same individual; and in other cases they have been so mixed that identification has been little short of a riddle. Failing precision with regard to skins and skulls, the anatomists have been too prone to found genera and species on imperfect data, ignoring differences of sex, age, and the like, and thus many technical divisions have been introduced which we hardly think it worth while here rigidly to follow.

The family Otariidæ, or Eared Seals, was distinguished, and so named by the French naturalist M. Péron early in this century, from the animals of this section possessing a small scroll-like external ear, an appendage wanting in the Seals generally. They moreover differ from the latter, and resemble the Walrus, inasmuch as they can freely progress on all-fours on land. Their skull is somewhat Bear-like, the neck being long. The fore-limbs, set well back, are tolerably free, and rest on a thin, broad, but flat hand of great size, encased in a leathery-like substance. The thumb is remarkably stout, and far exceeds the other fingers in length, and on all the merest indications of nails are present. Each finger is tipped with a long spatular cartilage, as are the toes of the hind feet, thus giving them great flexibility. The hind limbs are not so loosely attached by the tail membrane as in the Walrus, and the short tail is apparent close to the heels. The great toe is by far the longest and strongest, size diminishing from this to the little toe. As a rule, this family are nimbler on land than is the Walrus family, though both walk flat-footed in a somewhat similar fashion. The gait of the Otaries, however, from the slightly greater restraint of their closer-linked hind quarters and legs, and from the lengthening of their fore-flippers, is ridiculously peculiar. The fore-flippers, as Mr. Frank Buckland drolly observes, remind one of Bob Ridley's shoes in a nigger performance. From the wrist they flop, flop, in a semicircle as right and left foot is alternately raised, while the hind quarters hitch, hitch, as each hind foot comes wobble, wobble, under the belly, the great toes even overlapping the fore-flipper. The Sea Lions have long, stout, exceedingly mobile whiskers, though these are by no means so profuse, thick-set, or strong as in the Walrus. Their skeletons differ from the latter in several particulars of minor importance, the chief distinctions being in the skull and dentition. There are on each side three incisors in the upper jaw, and two in the lower. The middle ones are smallest, the upper outer ones more often very large. The canines are still larger, and recurved; but though powerful, not to be compared with the great tusks of the Morse. There are more commonly five teeth of the molar series, of which the crowns are bluntly conical, and the roots simple. The milk-teeth are mostly shed before birth. The dental formula of the Otariidæ may be represented thus:—Incisors, $\frac{3-3}{2-2}$; canines, $\frac{1-1}{1-1}$; premolars, $\frac{4-4}{4-4}$; molars, $\frac{2-2}{1-1} = 36$. The fore part of the skull is not so swollen out and abrupt as in the Walrus, the smaller size of the canines not requiring such space. In youth the skull is long, low, and flat, but in the old males there arise bony crests and processes, altering the shape, especially behind, so that recognition of the species is even difficult.

EAR OF OTARIA. (*Natural size.*) *After Murie.*



TEETH OF OTARIA. (*After De Blainville.*)

As the habits of the family of the Eared Seals are in the main very similar, and seeing how difficult it is from mere outward inspection to tell one species from the other, it seems advisable to follow Mr. J. W. Clark's mode of treatment, and consider all under the single genus

Otaria, though incidentally allusion will be made to such forms as are indicative of generic distinction.

We have in passing mentioned two kinds, namely, Fur and Hair Seals, and we have also stated that these Eared Seals are not confined to one hemisphere, but equally inhabit northern and southern regions. Taking these facts into account we submit the following table as a kind of provisional arrangement for the reader, that he may carry away a notion of what may be termed a combination of commercial and geographical divisions.

Northern.		*Southern.*
The Northern Fur Seal.	Fur Seals.	The Falkland Island Fur Seal. The South African, or Cape Fur Seal. The New Zealand Fur Seal. The Ash-Coloured Otary.
Steller's Sea Lion. Gilliespie's Hair Seal.	Hair Seals.	Hooker's Sea Bear. White-necked Otary. The Patagonian Sea Lion.

Thus eliminating doubtful forms, or such as naturalists are not unanimous upon, there are, so to say, some ten well-marked species of Otaries, whereof five belong to the so-called Fur, and five to the so-called Hair Seals. In the northern region there are but three peculiar to the West American coasts, &c., whereas seven inhabit the southern region. These latter range over a wide area, from warmer latitudes to the frigid zone. But it is very remarkable that in the whole of the Northern Atlantic none of the Sea Lions are now to be found. It is, however, noteworthy that in the neighbourhood of Antwerp, Professor P. J. Van Beneden has described some few fragmentary remains of a Seal allied to *Otaria*, which he has named *Mesotaria ambigua.* These fossil bones, along with numerous other remains of Pinnipedia and Cetacea, have been dug out of the upper Tertiary strata of Flanders.

As regards the precise geographical distribution, this will be referred to in connection with the species themselves. The absolute distinction between Hair and Fur Seals is one rather of degree than of kind, for as we have before hinted, all the family possess, at least in their early condition, evidence of under-fur, sparse or otherwise. But undoubtedly as age advances in some kinds it is very abundant, in others quite the reverse. Hence this character, though so apparent in some cases, is not one thoroughly to be relied on so far as zoological divisions are concerned, though very considerable stress has been laid upon it by some writers. So far as the skin is looked on as a mercantile commodity it unquestionably is a most useful mode of division, but a classification founded thereon must be taken with the accustomed "grain of salt."

If we look at a lady's Seal-skin jacket, we at once observe its rich brown colour, and the velvety softness and denseness of the fine hairs composing it. If this be compared with the coarse, hard, or salted dry Seal-skin as imported, or, still better, with the coat of the living Fur Seals, one is struck with the vast difference between them, and wonders how the coarse or oily-looking, close-pressed hair of the live animal can ever be transformed into the rich and costly garment above spoken of. Passing our finger among the hairs of the Cat or Dog, we may notice short fine hairs at the roots of the longer, coarser, general covering of the animal. This is the so-called under-fur. It equally obtains in most of the land as in the aquatic Carnivora. But in the greater number of these animals the short hairs are so few and often fine as to be comparatively speaking lost sight of among what to our eyes constitutes the coat. The remarkable feature, then, in the Fur Seals is its abundance and density. The operation which the skin undergoes to bring out, so to say, the fur may be briefly described as follows :—The skin, after being washed rid of grease, &c., is laid flat on the stretch, flesh side up. A flat knife is then passed across the flesh substance, thinning it to a very considerable extent. In doing this the blade severs the roots of the long strong hairs which penetrate the skin deeper than does the soft delicate under-fur. The rough hairs are then got rid of, while the fur retains its hold. A variety of subsidiary manipulations, in which the *pelt* is softened and preserved, are next gone through.

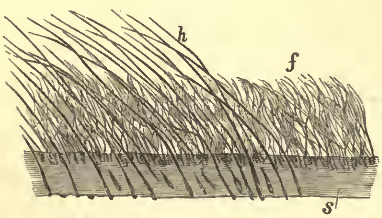


Diagram of a Vertical Section of the Skin of the Fur Seal, showing how (*h*) the coarser Hairs penetrate quite through (*s*) the Skin, while (*f*) the Fur has Roots comparatively superficial. (*After Murie.*)

These we need not enter into, but only further state that the fur undergoes a process of dyeing which produces that deep uniform tint so well known and admired. We may, however, mention that it is the dyeing process which causes the fur to lose its natural curly character and to present its limp appearance.

THE NORTHERN FUR SEAL.*—The habits and life history of this animal are probably more accurately known than those of any other of the Eared Seals. Fully a hundred and twenty years ago Steller, a naturalist in the employ of the Russian Government, spent a season in Kamstchatka and the islands in the neighbourhood of Behring Strait. During his sojourn he carefully studied the habits and anatomy of an animal termed by him Sea Bear, which existed in innumerable quantities in the region in question, publishing the results of his observations in the "Transactions" of the St. Petersburg Academy. A missionary, Krasheninikoff by name, some years later, under the title of Sea Cat, also gave an account of the same animal, but possibly deriving his information from the preceding writer. For a long period little was added to their narratives. In 1868 the Russian Government ceded to the United States the territory of Alaska, including several of the Aleutian Islands, and among others the Pribyloff group. These latter are remarkable and important, inasmuch as they are the resort of literally myriads of Seals, some of which are exceedingly valuable for their fur. A Captain Pribyloff had discovered the small island which bears his name in 1786, and thereafter a Russian company established themselves, carrying on an extensive trade in skins and oils up to the date of cession. The Russian Bishop Veniaminov, in 1840, gave an account of the Seals of the Pribyloff group, containing a statistical table of their probable numbers and evident decrease unless measures were taken to prevent their wholesale extermination.

The American Government wisely appointed agents, the result being reports by Captain C. Bryant and Mr. H. W. Elliott, which contained wonderfully graphic histories and descriptions of this Fur Seal and others of the group. To these gentlemen's reports we are chiefly indebted, and do not hesitate to abstract without stint.

The "Kautickie" is the name given by the Russians to this Fur Seal. It repairs to the Pribyloff Islands to breed in almost fabulous numbers, between the beginning of May and the middle of September, some few stragglers occasionally remaining even to the close of December; but between the beginning of June and end of September, they remain on the islands in grand force. The haunts of these creatures during the winter season, after leaving the islands, are doubtful; but it is supposed that they take up quarters by a southward migration to the Pacific coasts of the United States. At all events, it is known that in the stomachs of the voracious Killer-Whales and Sharks the remains of these and other species of Seal are not unfrequently obtained by the whalers in the region in question; and likewise the Indians of the North-west American coast, as low as California, then capture them in numbers.

The males, when full-grown, are between six and seven feet long, the females not being over four to four feet and a half in length, from head to tail. The former will weigh between four to six hundred pounds, the latter scarcely reaching one hundred pounds, but oftener eighty or less. The male, with a greyish shoulder, has the rest of the body varying from a reddish-grey to deep, almost pure, black; the nose and lips are brownish; the breast and abdomen with more of an orange and reddish-brown tint; the naked parts of the hind limbs are much blacker. The female is considerably lighter, being nearly uniform grey above, and brownish-grey on the sides. The young, previous to the first moult, is uniformly glossy black, with a yellowish-brown tint on the under parts. As it grows older, it becomes gradually lighter, especially in the females, and the two sexes then can hardly be distinguished. The distinction even in the young animal between the long, coarse hairs of the outer coat, and the dense silky fur of the inner coat, is very marked. There is occasionally some variation in the colour of the sexes, both as regards age and otherwise, but the above is that most common. The male of this Fur Seal does not attain its full size until about the sixth year, although it breeds at the fourth year. The females bear their first young when three years of age. The breeding-ground, or "rookery," as the colony of the Seals is termed, lies among the belt of loose rocks along the shores, between high-water line and the base of the cliffs, and varies in width from 60 to 150 feet. There are, besides, sand-beaches of large extent, and these stretch

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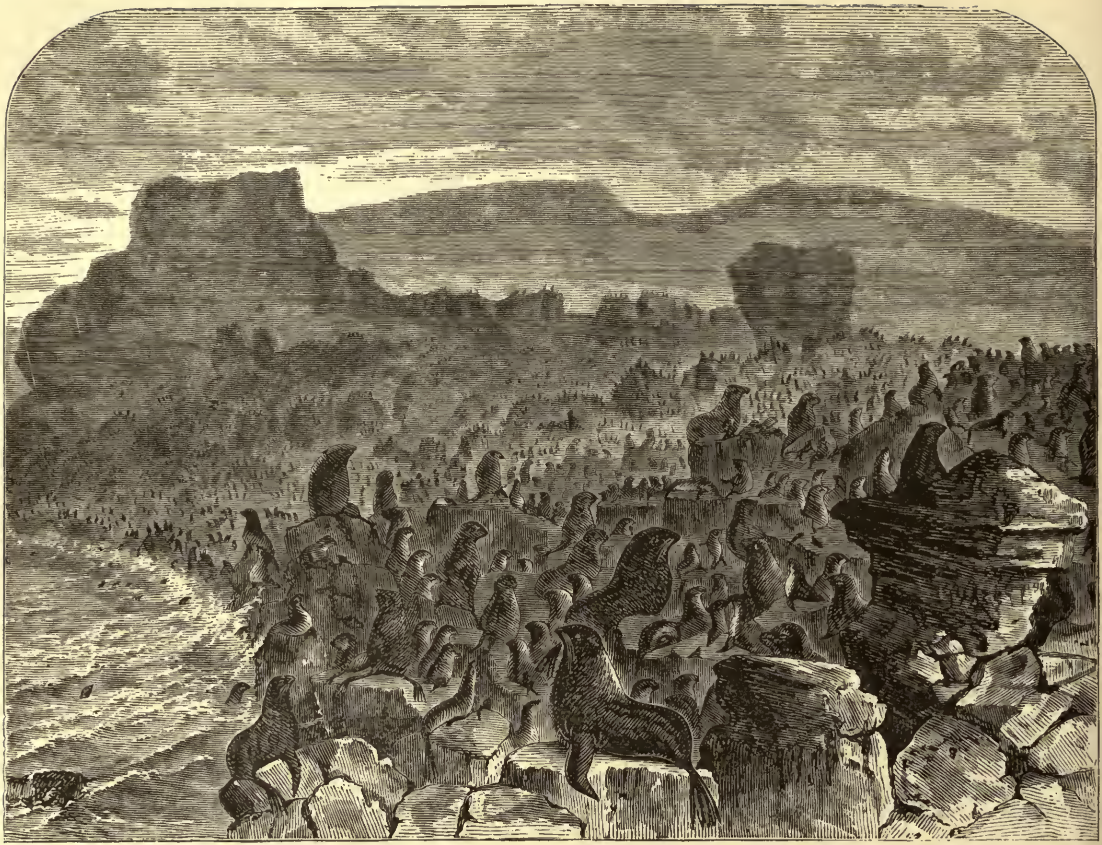
* *Otaria ursinus*, the genus *Callorhinus* of certain authorities.



"ROOKERY" OF FUR SEALS.

more inland to grassy hillocks; the said areas are used as temporary resting-places, playgrounds, and neutral territory, where young, old, and infirm or wounded may resort to undisturbed. To these sandy beaches and uplands the term "Hauling-grounds" is given, from the manner in which the Seals drag themselves out of the water in going towards them.

From whatever reason, the adult males seem to leave the herd and betake themselves to the Pribyloff Islands in the spring months, when, in the first few days of May, they make their appearance, and in a suspicious, doubtful manner swim idly about, apparently reluctant to land. Soon, however, the older "bulls" approach the loose rocky shore, and commence to locate themselves. Each individual animal takes possession of a piece of ground about ten feet square, and, as those fresh from the sea approach, there begins a series of battles as to which is to retain the ground first occupied. All during the month of May, and even to the first week of June, this terrible warfare proceeds incessantly, and those next the water have to resist all comers, or themselves be forced farther back. Meantime, from the beginning till almost towards the end of June, the pregnant females make their appearance, first in small numbers, until the great body arrive in mass at the close of the month. Each male retains his position as best he can, whilst some of the females hesitate to land, calling out as if in search of some particular mate. The males coaxingly strive to inveigle them ashore, and no sooner do the females approach than they are laid hold of, and a general warfare among the whole "rookery" ensues. The quiet, unoffending, small-sized females are subjected to dreadful usage. The strong and powerful males secure, where possible, from twelve to fifteen partners in their seraglio, but to retain these is indeed a most serious business. Day and night the males, who have never left their station for at least six weeks, have still to keep watch and ward over their accommodating spouses, the only sense of *meum* and *tuum* being force. If the master of the harem dare for a moment to doze, down comes his more wideawake neighbour from behind, to obtain by foul means what he cannot obtain by fair; or some slippery partner, desirous of change, seeks to escape the bondage of her lord. Then ensues internecine and domestic strife, in which all the neighbouring males join, whenever there is a chance of capturing a coveted female. The poor wives suffer equally with their spouses—trampled, bitten, and dashed about. It results that he alone keeps who has the power to withstand his numerous assailants. Some of the females may have the fortune to get more comfortably settled than others, which are bandied from one location to another, until most of the males obtain a few partners, the lucky ones in front securing and holding the greatest number, those behind being obliged to content themselves with half-a-dozen or thereabouts.

A few days only have elapsed, and matters settled down more quietly, when the females give birth each to a single one. The little fellows soon find their voice—a kind of bleat like a young lamb's,—begin paddling about, and then suckle. They gorge themselves heartily with the rich creamy milk. But, strange to say, the mother seems remarkably indifferent to her offspring; and, if it stray beyond the limits of the family group, it may be abducted by the other Seals for all that she cares.

SEAL FIGHT.

About this time, many of the old males who have successfully held their position become exhausted, and now and again the less fortunate or single males behind, in stronger or fresher condition, drive the former from their posts, and the latter take their places. There is no wonder that exhaustion succeeds. Indeed, one of the most remarkable features in the history of these Sea Lions is that for two months and more these heroic males, that arrived fat and plump from their winter quarters, have held their positions on land against all comers, and this without tasting food, water, or almost sleep during this period. It seems scarcely credible that animals incessantly on the watch, excited and bearing the brunt of sanguinary contests, should be able to undergo starvation under such circumstances. This fact is almost unique in natural history; for, though hibernation for long periods is common to the Bear, Hedgehog, &c., their winter sleep is accompanied by cessation of all bodily exertion, and the functions of circulation, respiration, and digestion are comparatively at a standstill. In truth, how this and other species of Otaria, for the habit is not limited to the Fur Seal, endure such a lengthened abstinence, physiology fails to explain.

While the families, in groups as afore mentioned, with their dominate lords, hold the favourite grounds, the great mass of the younger members of the community are not thoroughly excluded from the domains of the "rookery." By common consent, here and there long narrow lanes of neutral ground are left open from the beach upwards, and along these continually pass to and fro the non-breeding animals. These go to the rear, where they pack themselves in a kind of general medley, their gregarious nature leading them there to swarm.

The young animals in the beginning of August begin to take to the water, with which they soon become familiar, frolicking about, and returning like lazy Dogs to sleep after their exertions. They grow fast, and gathering in squads swarm over the whole "rookery." The colony now begins to break up from the family-parties first instituted. Some besport themselves, or possibly feed in the neighbourhood; others range on the sandy and grassy uplands, in groups of hundreds to thousands, and seem to play and enjoy themselves in a rollicking, lively manner. Their gambolling is very good-natured, then seldom quarrelling. They appear to delight in dashing through the breakers, and "hauling up" on the surf-beaten shore. In dull, foggy weather, they crowd close together in myriads, and a bright, warm day sends them off quickly to the water, seemingly to avoid heat.

What they live on during all this period it is difficult to state, for the fish round the island appear to be driven off on the arrival of the Sea Lions. They, nevertheless, subsist and thrive. In the stomachs of most of the older animals several pounds' weight of pebbles are usually found.

At one time 100,000 young males were killed annually, the females not being interfered with. This will show how enormous the number of Seals on these islands was. But the slaughter has not always been wisely regulated. When the Russian American Company first hunted, up till 1837, they ran great danger of exterminating all, killing every animal regardless of sex; and complications have occasionally arisen between the United States and Great Britain about the right of fishery, the former Government being desirous of preventing the extinction of the Seals, and on that account claiming a wide jurisdiction in the Behring Sea. Mr. Elliott, by roughly numbering the animals in a family group, and estimating the given area of the "rookeries" when the greatest mass are on shore, calculated the total numbers at between four and five millions.

The killing of these Seals is quite a peculiar occupation of the islanders. After the breeding season, the hunters take advantage of the dull and foggy weather, and creep down between the herd and the water. Then suddenly rising and shouting together they drive landwards the affrighted animals, though many of course escape. Closing on them, they allow the females and the very old males by degrees to pass, and then drive the remainder at a slow rate towards the killing-ground, some distance off. Watchers remain over night with them, and in the morning, when the Seals have rested and cooled down, the work of slaughter begins. Squads of forty or fifty are separated, and the islanders then surround these in a body, the animals meantime huddling together and treading over each other's flippers, cannot well attack or defend themselves, and they are then clubbed by blows on the head. While this bloody process is going on, a number of the men dexterously skin the animals, and others look after the blubber, and such parts as are useful for food and other purposes.

STELLER'S SEA LION,* OR THE HAIR SEAL OF THE PRIBYLOFFS, is an animal in some respects not unlike the Fur Seal originally described by the aforesaid Russian naturalist. But it is a much more powerful animal, and though in contiguity to its congener originally named by this author Sea Bear, it differs in habits as well as in other particulars, besides the broad fact of its possessing such sparse, and, when old, such absence of under-wool that it comes to be classed as a true Hair Seal. The male and female animal are of unequal size; the former attains a bodily length of eleven or twelve feet, and a weight of 1,000lbs. and more, while the latter is barely more than half the dimensions and weight of her partner. The male has quite a leonine appearance and bearing, and often exhibits great ferocity of expression. His colour is of a golden rufous tint, darker behind, or occasionally with brownish patches, the limbs more nearly approaching black. Some variation occurs with regard to the brindling and hue generally, the female being slightly paler than the male.

Their movements on land, though in many respects similar to, are not so free as those of the Fur Seal, and never are they found far from the water. Some of them herd along with the Fur Seals, their powerful organisation enabling them to hold and retain the shore locations. They, however,

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* *Otaria Stelleri*, the genus *Eumetopias* of Gray and others.

SEA LIONS ON THE FARALLONE ISLANDS.

congregate in breeding-grounds slightly apart. While polygamous, they have not the regular system, nor give such attention to their harem as does the *Callorhinus*. In comparison with the latter, their numbers on the Pribyloffs are not great, in all between thirty and forty thousand. They are shy creatures, and, as Elliott remarks, on the slightest approach of man, a stampede into the water is the certain result.

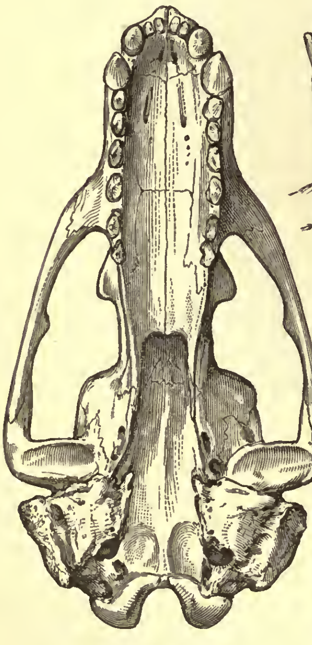
Their voice is said to be a deep and grand roar, and when in mass has been likened to the howling of a tempest. The males come to these islands in the beginning of May, and the females a month later. The young are soon born, and at birth average twenty to twenty-five pounds, and two feet long, and then are of a dark chocolate-brown colour, with great watery grey-blue eyes. They shed their coat in October and become lighter, but do not precisely resemble their parents until they grow more adult.

This animal being destitute of fur, its skin is of little value; but their hides, their fat, their flesh, their sinews, and intestines, are all useful to the Aleutian islanders. The last, the throat-linings, and the skin of the flippers, are tanned into excellent leather, and both waterproof coats and the natives' boots (*tarbosars*) are made out of them. Oil-vessels are made from the stomachs, the sinews are used for threads for binding their skin-canoes, and to the flesh of this species there is given a decided preference.

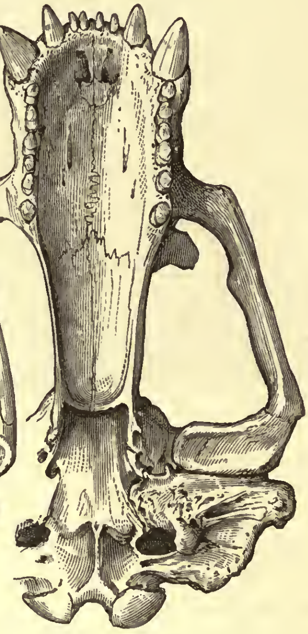
Steller's Sea Lion has a wider distribution, probably, than *O. ursina*, and stretches around Kamstchatka and the Asiatic coast to the Kurile Islands. Moreover, on the American coast as far as California they are occasionally met with. Indeed, one of the sights at San Francisco is the "Ocean House," a large hotel opposite the Seal Rocks at the mouth of the bay, whence a good view is obtained of a "rookery" of Sea Lions, now rigidly preserved by the American Government. They also inhabit the Farallone Islands about thirty miles from San Francisco.

The natives of Kamstchatka, to the coast of Siberia, capture the Sea Lions differently from the Pribyloff Islanders. In the summer months, Salmon swarm at the mouths of the rivers, the Seals following and preying on them. Strong wide-meshed nets, made of Seal-thong, are staked in a curve open to the confluence of the stream. The fish find a free passage, but the pursuing Seals become entangled, and the natives in flat-bottomed skin-boats approach and despatch the victims with rude bone implements. In the spring and fall they capture them on the floating ice, and during winter watch for their rising out of their breathing-holes to rest awhile, while the hunter deals destruction from behind a snow-bank or ice-cake. These natives convert the prepared hide for the Dog and Reindeer sledges and other purposes, and the blubber is a godsend.

GILLIESPIE'S HAIR SEAL,* OR SCHLEGEL'S JAPANESE OTARY.—This animal also inhabits the bays and islands of the Californian coast, but the first good account of it came from the pen of Professor Schlegel, of Leyden, in his "Fauna Japonica," though, curiously enough, he confounded it with Steller's Sea Lion. It undoubtedly frequents the Japanese coasts, and, possibly, other spots in the North Pacific. Dr. Macbain, in describing a skull from California, showed its specific distinction. Indeed, from its having one pair less of upper molars, a narrow muzzle and facial profile, and great skull-crest, it has been placed by Gill and others in a separate genus (*Zalophus*). But as before indicated, we prefer to consider the whole of these Sea Lions as belonging to Otaria. The colour of this animal much resembles that of the last, or slightly more of a pale brownish-grey, underneath yellowish, but also darker in the limbs. The sexes approach each other in this respect. It is smaller in size than *O. Stelleri*, the largest known male being little over six feet long, and the female relatively smaller.



PALATE OF HOOKER'S SEA BEAR.



PALATE OF PATAGONIAN SEA LION.

HOOKER'S SEA BEAR.†—Among the collection obtained during the eventful voyage, under Captain Sir J. C. Ross, in the *Erebus* and *Terror* to the Antarctic regions, were the skin and skeleton of a Sea Bear from the Auckland Islands, which Dr. Gray named after the celebrated botanist of the Expedition, Dr. (afterwards Sir) Joseph D. Hooker. No account of the life-history of the animal accompanied these remains, but the narrow skull, deeply concave palate-bones, and other osteological features, clearly showed its specific distinction. The precise geographical distribution of this Sea Bear thereafter became a knotty point, and from general outward resemblance of the Otary tribe one to the other it has been confounded with several of them. The investigations of Mr. J. W. Clark of Cambridge, however, set this at rest, and without enlarging into particulars, we shall briefly say that he has shown that besides the English voyagers, the French Expedition in the *Astrolabe* (1826–29), and Captain Thomas Musgrave (of whom I shall say something immediately), obtained it at the Aucklands. Moreover, the French, in their last Transit of Venus Expedition—to Campbell Islands—there met with it, and Mr. Clark identified it with a sub-fossil form found by Dr. Hector on the coast of New Zealand.

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* *Otaria Gilliespii.*

† *Otaria Hookeri*, the genus *Arctocephalus* and *Phocarctos* of Gray.

The original specimens of this Hair Seal in the British Museum are throughout of a darkish grey, inclining to yellow, or yellowish-brown, and what appears to be the male is about five feet long, while the female is smaller and yellower in colour.

The little that we know of the habits of this creature is chiefly derived from Captain Musgrave's extraordinary narrative, "Castaway on the Auckland Islands." In 1863, the schooner *Grafton*, of Sydney, was wrecked on the islands in question, where captain and crew were condemned to reside for twenty months. His journal of their sufferings on these desolate rocks was written in Seal's blood, and the editor of the gallant captain's narrative appropriately quotes worthy old Richard Hakluyt's words:—"How shall I admire your heroicke courage, ye marine worthies beyond all names of worthinesse!"

Before the distressed seamen had been a week on shore, the captain notes "that the Seals are very numerous here, and go roaring about the woods like wild cattle; indeed, we expect they will come and storm the tent some night." They found the sucklings delicious eating, exactly like lamb, but the flesh of the old males was rejected. Indeed, stewed, boiled, or roasted Seal's flesh and liver, with roots fried in oil, and occasionally mussels and fish, constituted dainties; for it happened at times they were driven to extremities for lack of fare. For a while a few crumbs of biscuit were regularly laid on the table, but only to look at, "or point at," as Paddy would say. On a single occasion they obtained the milk of a slain female, which they considered to be rich and good, and superior to Goats' milk. Needful of clothing, blankets, and shoes, by a rude manipulation with lye of ashes, drying and rubbing, and by tanning with bark, the skins were thus rendered available. Seals' tracks were found at the top of a mountain four miles from the water. They run fast in the bush, and where it is thick have an advantage over men, even climbing rocky cliffs and steep slippery banks almost inaccessible to the latter. Captain Musgrave believes their sense of smell to be very keen, but neither hearing nor sight acute on land. The old "bulls" have long, coarse, almost bristly fur on their neck and shoulders, which ruffles up when attacked, and this, with their great teeth, gives them rather a formidable leonine appearance. These "bulls" are savage, and so fierce that caution is required in facing them; they even are so bold as to leave the water and chase a man. One great and very old dark-coloured fellow, "king of a mob," was christened "Royal Tom," whose daring and dignity would barely allow him to move off when driven hard. On board the vessel which rescued the castaway survivors was a very large courageous Dog, which would fasten on the Otaries, but get dreadfully torn, and was no match in point of strength. Their tenacity of life is extraordinary. For instance, one received two bullets, had its head split open with an axe, and brain hanging out, but nevertheless dragged along the beach the men who were trying to keep him out of the water by hanging on his hind flippers. The males arrive in October, fat, choose ground, fight furiously, and remain until the end of February. The females go with young about eleven months, and bear a single offspring in February; but previous to parturition, in December and January, the smaller timid females wander in the bush bellowing in a dismal manner. The new-born young are black, become greyer after a few weeks, and when older brownish, the adult colouring following. Musgrave recounts the amusing manner in which the mother coaxes the young towards the water, which at first it is averse to enter, and she often displays ingenuity in getting it in. She puts it on her back, swims along gently, while the little bleating fellow slips or splutters off into the sea; the mother again gets underneath, or even becoming angry, gives it a cruel bite or slap with flipper. Ultimately, after such drilling, the youngsters take to the water of their own accord, and paddle about or play on shore in groups. There is a periodical migration of these Hooker's Sea Bears, but it is not so regular as in some other species, several remaining in the same quarters all the year round. They shift their camp, though, in the bays, and sleep ashore only at night. When in the water Captain Musgrave assures us their speed is very great, not exceeding twenty miles an hour, and they have a most extraordinary power of arresting their progress instantaneously.

White-necked Otary,[*] or Australian Sea Lion.—Under these two names, and those of the Counsellor Seal, the Cowled Seal, and Gray's Australian Hair Seal, has the Sea Lion been called which inhabits the shores of Australia. Two localities are specially noted—Houtman's Abrolhos and King George's Sound, on the west and south-western parts of the continent—though Mr. Scott mentions that this species was formerly very abundant in Bass's Strait, as also on the north-west coast of Australia, and that it is still found tolerably numerous on the Seal Rocks off Port Stephens, a short distance north of Sydney. Very old males of this animal are stated to attain a length of twelve feet, and to be as large in girth as a Horse, but adults from eight to nine feet long are more commonly met with, the females being still smaller. Mr. J. W. Clark deftly catches the salient points as follows:—"The adult has the face, front, and sides of the neck, all the under surface, sides, and back, dark or blackish-brown, passing into dark slaty grey on the extremities of the limbs; the hinder half of the crown, the nape and back of the neck, rich deep fawn-colour. It is the peculiar shape of this stripe of light colour stretching over head and neck which has given it the name of 'Cowled Seal,' and perhaps the appellation 'Counsellor Seal,' which I find is also applied to it, may have been suggested from a fancied resemblance to a barrister in his wig." The males and females differ in colour, the latter being lighter in tint. The white neck-spot, it is suggested, distinguishes the males. The "pups" are born black, and have an abundant coat of soft fur which diminishes with age, and in the old animal is entirely wanting. The skins, therefore, are of no great value, but as a commercial product the oil is of more importance.

The Patagonian Sea Lion,[†] or Cook's Otary.—Magellan, after whom the Strait dividing Tierra del Fuego from Patagonia is called, in his eventful voyage (1520) found, off the Rio de la Plata, what the Spaniards knew as a Sea Wolf (*Lobos de mar*), doubtless the Otary above named, for even in the present day the Government of Buenos Ayres protect the colony of Seals of one of the islands at which the celebrated navigator touched. Now these animals are scarce, and their range somewhat limited, but when the buccaneers carried fire and sword into the Spanish provinces they were of frequent occurrence, not only around Patagonia and the neighbouring islands, but up the Peruvian coast. Few of the voyagers that afterwards passed along these shores but had some slight adventure to relate concerning these creatures.

It was this animal that attracted the attention of Captain Cook and his naturalist, Forster, both describing it, the latter giving it the specific name of *jubata*, from the Latin *juba* (a mane), a feature, however, that some naturalists of the present day are inclined to deny. But the fact is that at that date many exceedingly old, large, and rugged individuals of this species existed which are no longer to be met with.

Apart from the historical connections attaching to this creature, inasmuch as many famous voyagers' names have been associated with it, in our own generation it is remarkable as that first brought alive to England. The individual in question was latterly purchased by the Zoological Society, and died in their Gardens in 1867, in consequence of having swallowed a fish-hook among the food given to it. This notable animal created an interest in the Eared Seals (hitherto little studied) which since has led to the introduction of several living examples and of different species. To those who only knew the Seal tribe from the common sort, this Otaria seemed a marvel of docility, and at a glance most distinct in appearance, habits, and intelligence from anything heretofore exhibited. It was originally captured in the neighbourhood of Cape Horn, and François Lecomte, the French sailor into whose possession it fell, exhibited the animal for a short time in Buenos Ayres before bringing it to London, where for a time he earned a living by showing it off. By kindness and dint of training he taught it to become quite a performer in its way, mounting a ladder with perfect ease, and descending indifferently, head or tail foremost. It fired a small cannon, and went through several other performances indicative of the teachableness of its disposition and the successful assiduity of its trainer. From being cribbed, cabined, and confined, the animal, on its transference to the Zoological Gardens, was allowed the use of a spacious pond, and along with others of the Seal tribe exhibited greater freedom and naturalness of habit. So well known have its appearance and little tricks of mounting chairs, catching with open mouth fish thrown towards it, kissing its keeper, and so on, become, that it is needless to enter upon a detailed account of these matters. There is no doubt, however, that this animal, and others of different species since shown at the Zoological Gardens, Brighton Aquarium, and elsewhere, have manifested traits of brain-power of a superior kind. One feature has struck all, namely, its voracity, twenty-five pounds of fish a day being barely more than short commons. If we estimate this amount to each individual, namely, an equivalent of 9,000 pounds a year, and remember that there exist colonies of these animals more than a million in number, the wonder arises that the finny tribe is not exterminated in those spots inhabited by the Seals.

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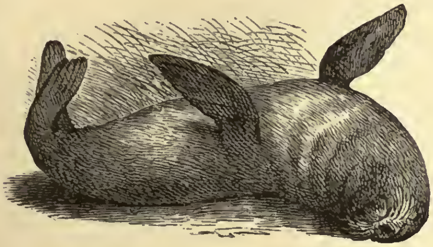
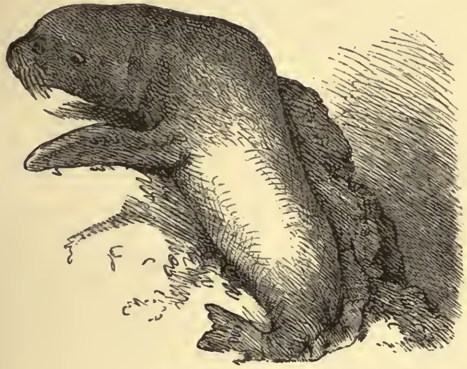
[*] *Otaria albicollis*, the *Neophoca lobata* of Gray.

[†] *Otaria jubata*.

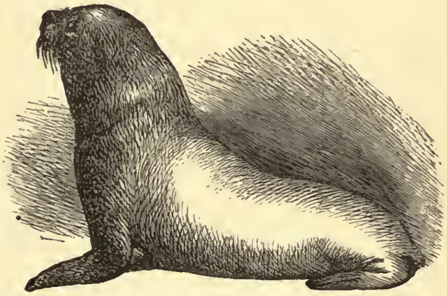


SEA LION DOZING ON HIS BACK.

SEA LION FAST ASLEEP.

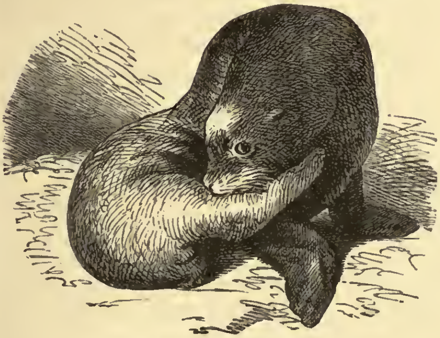


SEA LION CLIMBING.

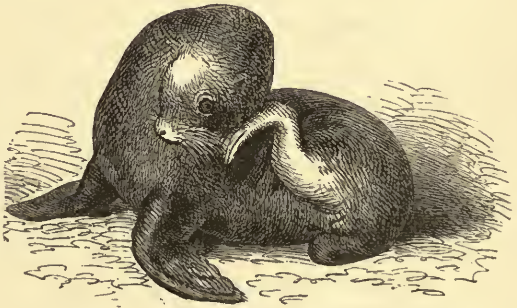


SEA LION IN WATCHFUL ATTITUDE.

The success accompanying the above animal's exhibition led to the Zoological Society's sending Lecomte to the Falklands to procure more. Although he obtained a number, most met mishaps and died before reaching London. His account of their habits and nature corroborates the earlier observers. According to him, families range from six to twenty, a dozen being the average, while a herd would be composed of several families. Located in the islands and isthmuses, an old male guards as sentinel, and signals, by a growl, approaching danger. Between sleeping and procuring food they



SEA LION LICKING HIS LEG.



SEA LION SCRATCHING WITH HIND FOOT.

pass their time, often lying huddled in a drowsy condition. At high tides, night and day, they take to fishing near the entrance of fresh-water rivulets into the sea, at such times remaining for a whole tide dabbling after fish and crustaceans. In capturing their prey, they swallow it above or below the water. The animal at the Zoological Gardens, as a rule, came to the surface to swallow, but the other Seals more often did so underneath. This Otaria, Lecomte affirms, never drinks water, that which he first brought to England not receiving fluid for a year, but he had seen the Common Seals suck water like a Horse. He certified to the fact of their pebble-swallowing propensities. The general habits of this animal are but a repetition of what has been said of other species, and need not detain us. The greater number migrate towards the south from July till November, between these months remaining in the neighbourhood of the Falklands. The young are of a deep chocolate colour, when a year old becoming paler, the females being nearly grey, the old male of a rich brown hue, the flippers in all being darker. There is a sparse under-wool in the young, which sensibly diminishes with age.

Captain Cook says he met with immense males, twelve or fourteen feet in length, and eight or ten in circumference. Such big customers now no longer exist, though the truth of what the circumnavigator asserts would seem to be substantiated by the fact of skulls of enormous size being found hither and thither, weather-worn, on the beach. These exhibit the remarkable peculiarity of prodigious crests, so that they have been compared with the characteristic change shown in the Gorilla, to which allusion has already been made (Vol. I., p. 17).

The Falkland Island Fur Seal.*—The head-quarters for the capture of this valuable species of commercial Fur Seal are the Falkland Isles, and the South Shetlands within the Antarctic Circle, but it is also found on the coast of South America, namely, around Patagonia, Cape Horn, and the islands bordering Chili. It doubtless also betakes itself to several of the small southern oceanic islets, such as the New Orkneys, South Georgia, and indeed very possibly migrates to the ice-bound areas surrounding the Southern Pole. Captain Abbott, who was formerly resident on the Falklands, says that Seal skins and Seal oil are two of the principal products of these islands. The boats employed in collecting these articles "are usually from twenty to thirty tons in measurement, and are manned by four or five men. They are sent out laden with provisions, casks for the oil, and salt for preserving the Seal skins; they are frequently out for months together, cruising about the islands, and seldom return without a full cargo." The favourite locality of this valuable Fur Seal at the Falklands is the Volunteer Rocks at the northern entrance to Berkeley Sound, these rocks, owing to the heavy swell, being inaccessible except in fine weather and after many days' calm. The truth is the hunters have driven these animals nearly away from their old quarters, the few that still remain being excessively shy. The best, almost classical account of the habits of this species, is that of Captain Weddell, in his "Voyage towards the South Pole," between 1818–1821. When he visited the South Shetlands, so little did they apprehend danger from man, that they lay quietly by while their neighbours were being killed and skinned. But, as he says, they soon acquired habits for counteracting danger, by placing themselves on rocks whence they precipitated themselves into the water. Their agility is very great, outstripping men running fast in pursuit. The absurd story of their throwing stones at their pursuers with their tails, Weddell accounts for by their awkward trailing gait, and in an attempt to scamper, scattering rocky fragments hither and thither behind them. He mentions their exceeding disproportion of size, the males, as in other species, being the more bulky, the latter being six to seven feet long, the females seldom more than four feet, and often less. He computed the females at about twenty to one male. They assemble gregariously on the coasts at different periods and in distinct classes. Like the Northern Fur Seals, the males separate and go ashore in November, where they await the arrival of the females. By December these latter begin to land, and the seraglio and system of battle resemble what has been described in the Fur Seal of the Pribyloff Islands. The period of gestation is about a twelvemonth, probably less, and the young are born in December. By the middle of February these latter, said to be taught to swim by their mothers, take to the water. At first they are black, a few weeks later become grey, and afterwards, as they frequent the sea, moult and acquire their peculiar furry coats. What the mariners call Dog Seals, that is, those a couple of years old, land in crowds as February terminates and March goes on. But by the end of April they once more make for the water, and scarcely land again until June wanes,

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* *Otaria falklandica*, placed under the genus *Arctophoca* by Peters, and *Euotaria* by Gray.

FALKLAND ISLAND FUR SEAL.

then they occupy irregularly the land and water for several weeks. Towards the close of August the herds of young Seals of both sexes again return on shore for a few weeks, and retire ultimately to the water, to be succeeded by the old and more powerful males, as above stated. Excepting the difference of season, their habits much resemble those of *O. ursinus.* As in the other Otaries, colour varies with age. The darker tint of the young, as they grow older, tones down to a rich brown, with the under parts yellow, the hairs being tipped with greyish-white. The hairs are by no means so strong as in the Hair Seals, while the under-fur is thick, soft, and of a ruddy brown hue. Their skins are among the most valuable in the market.

THE SOUTH AFRICAN, OR CAPE FUR SEAL.*—We are still, as Mr. J. W. Clark remarked a few years ago, in a "lamentable state of ignorance about the Sea Lions of the Cape of Good Hope —indeed, we cannot say with certainty whether there are one or two species—though, from that centre of trade, cargoes of 60,000 or 70,000 skins come annually to the London market." In 1875, the Zoological Society obtained, presented through Sir Henry Barkly, a living specimen of Sea Lion, taken at the Cape, which was smaller in size than the Patagonian Sea Lion (*O. jubata*) exhibited along with it. This individual had a whitish-red coat, grizzled with blackish hairs, the under side of the body, as likewise the short fur, being of a richer reddish-brown. When it came out of the water, its then sleek skin closely resembled that of the latter well-known example of a Hair Seal. The process of dressing the skin we have already described, doubtless, would bring out the fact of its possessing the rich fur coat not obvious in the living animal. This would appear to agree with the barely adult stage of the animal. Flat skins, apparently of this same species from the Cape, figure largely in the trade sales, and those similar to the above in age are technically called "middlings." The smaller sorts of the sale catalogue, "pups," or "black pups," have smooth, soft, polished, black hairs more ruddy beneath. The large skins with a slight mane, the "large wigs" of the dealers, have whitish fur intermixed with black hairs and short reddish under-fur. The habits of the live animal in confinement quite resemble those of the other Sea Lions living alongside.

THE NEW ZEALAND FUR SEAL.†—The investigations of Mr. J. W. Clark ("Proceedings of the Zoological Society," 1875) tend to the conclusion that the Fur Seals originally met with by Captain Cook on the shores of New Zealand, and also by him and Flinders in Bass's Strait and the coasts of Tasmania, belonged to one and the same species. J. R. Forster, the naturalist who accompanied Cook, made some spirited sketches (now in the British Museum) of the living forms, which agree in most respects with animals obtained in 1871–5 by Dr. Hector in New Zealand. In 1773, during his second voyage of circumnavigation, Captain Cook cast anchor in Dusky Bay, New Zealand, and records that he saw great numbers of Seals on the small rocks and islets in this neighbourhood. Forster made careful notes thereon, besides his drawings. He says they are Seals with ears, hands free, feet webbed on the under surface, naked between the fingers, hardly nailed. Gregarious in habits, they are timid, and fling themselves off the rocks into the sea at the approach of man; but the most powerful resist when attacked, bite the weapons used against them, and even venture to assail the boats. They swim with such rapidity under water that a boat rowed by six strong men can scarcely keep up with them. Tenacious of life to a degree, a fractured skull did not despatch them. The weight of the full-grown is 220 lbs., of cubs scarcely 12 lbs.; the former are six or seven feet long, the latter barely two and a half. The hair is soft, black, with reddish-grey tips and a delicate reddish under-fur.

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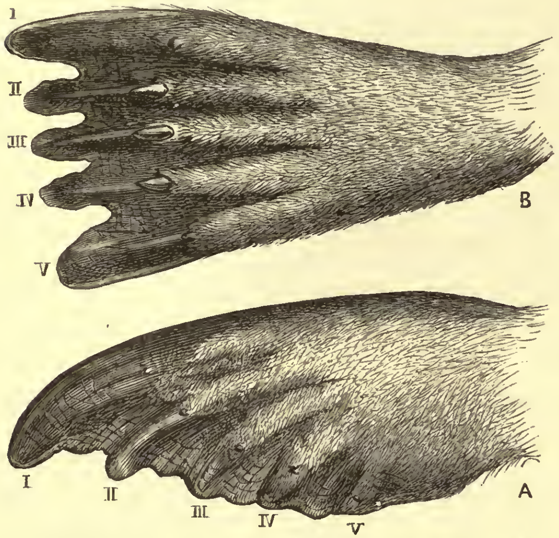
* *Otaria pusilla*, the *Arctocephalus antarcticus* of Gray.

† *Otaria Forsteri*, the *Gypsophoca tropicalis* of Gray.



LEFT FORE (A) AND HIND (B) FLIPPER OF NEW ZEALAND FUR SEAL. (*After J. W. Clark.*)

Mr. Clark and Dr. Hector agree as to the general colour. The young are black when wet, when dry, lighter below; individual hairs pale yellow at base with light yellow tips, and a dense under-fur of the same tint. The older animals have hairs tipped with white. Round the mouth and ears are pale yellow. These Seals are fast disappearing or retiring to the Southern Antarctic Ocean. They possibly may be found in some of the smaller islands south of New Zealand, such as Auckland and Campbell Islands. On this point, however, information is required, but it has been shown at least that Hooker's Sea Bear frequents these latter, and, as already observed, is known in a sub-fossil state in New Zealand.

At the beginning of this century the sealing-trade of New South Wales was at its height, and vessels, manned by crews of from twenty-five to thirty men, pursued the craft. Mr. Scott, on the authority of Mr. Morris, an old Sydney sealer by profession, remarks that "to so great an extent was this indiscriminate killing carried, that in two years (1814–15) no less than 400,000 skins were obtained from Penantipod, or Antipodes Island, alone, and necessarily collected in so hasty a manner that very many of them were but imperfectly cured. The ship *Pegasus* took home 100,000 of these in bulk, and on her arrival in London, the skins, having heated during the voyage, had to be dug out of the hold, and were sold as manure—a sad and reckless waste of life."

THE ASH-COLOURED OTARY.*—It is to be regretted that a memoir on the Eared Seals from the pen of the admirable Péron was lost to science by his lamented early demise. The French *savant*, when sojourning on the South Australian coast at Kangaroo Island, found a new species of the genus, which he named *O. cinerea*, this attaining a length of nine to ten feet. He stated that the hair of this animal is very short, hard, and coarse, but its leather is thick and strong, and the oil prepared from its fat is as good as it is abundant and he recommends pursuit of it and the other Seals with fur of good quality.

Most likely it is the same animal to which Flinders alludes when he says, speaking of Kangaroo Island, which abounded with Kangaroos and Seals: "They seem to dwell mainly together. It not unfrequently happened that the report of a gun fired at a Kangaroo near the beach brought out two or three bellowing Seals from under the bushes considerably farther from the water-side. The

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* *Otaria* (*Euotaria*) *cinerea.*

Seal, indeed, seems to be much the more discerning animal of the two; for its actions bespoke a knowledge of our not being Kangaroos, whereas the Kangaroo not unfrequently appeared to consider us to be Seals."

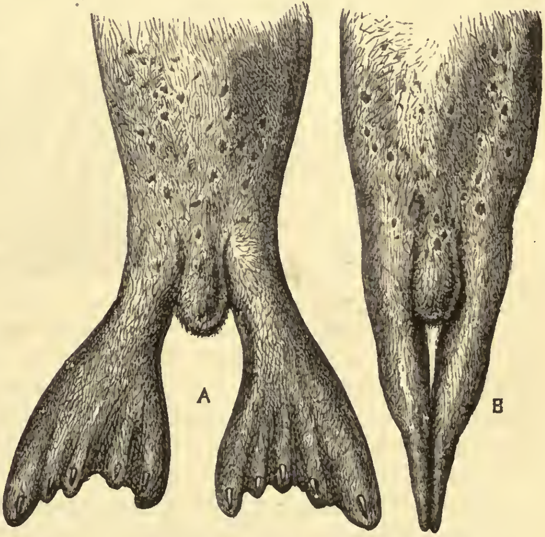
It evidently is to Péron's animal, or one otherwise not to be distinguished from it, that the naturalists of the *Astrolabe*, fully twenty years after, referred as the *Phoque cendrée* frequenting Port Western, Australia. This appears to be a distinct animal from others hitherto described, though so little is positively known that I shall merely draw attention to its colour. It is grey on the back, lighter on the muzzle, and rusty-grey on the lower parts of the body. It has sparse reddish under-fur, and Clark states of the somewhat dilapidated skin preserved in the Paris Museum that it has a length of between seven and eight feet.

CHAPTER III.

III.—THE EARLESS SEAL FAMILY (PHOCIDÆ).

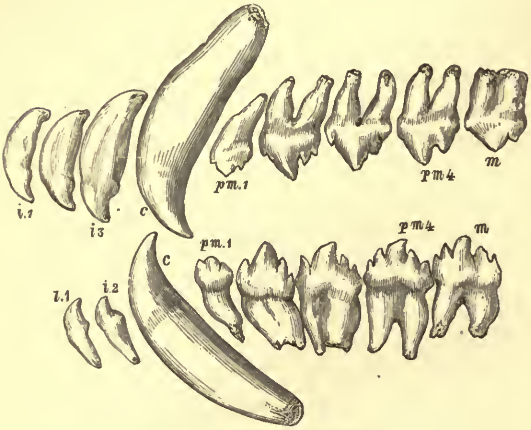
General Characteristics—Peculiar Formation of the Hind Legs—Dentition—Swimming—THE COMMON SEAL—Range—Fight between a Seal and Salmon—Colour—Appearance—Annual Catch—Use of Skins in Greenland—Habits—THE RINGED SEAL—Appearance—Various Names—Odour—Flesh—Skin Clothes—Haunts—Modes of Capture—Range—THE GREENLAND, or SADDLEBACK SEAL—Habits—Appearance—Names—Range—Migrations—"Seals' Weddings"—Five Stages of Colour—Females—Weight—Seal Fisheries—Hunting—Implements of Slaughter—Various Operations—The Sealers—Oil, Skins, &c.—THE BEARDED SEAL—THE GREY SEAL—THE MONK SEAL—THE CRESTED OR BLADDER-NOSE SEAL—Range—Size—Ferocity—Character of the so-called Crest—Dentition—Colour—THE ELEPHANT SEAL—Peculiar Range—Proboscis—Scammon's Account—Habits—Hunting—Hardships of the Hunters—Recreations of the Men—Blubber, Oil, and Skins—ROSS'S LARGE-EYED SEAL—THE SEA LEOPARD—WEDDELL'S SEAL—THE CRAB-EATING SEAL—Concluding Remarks—The Slaughter of Seals—Remedies.

THOUGH the want of external ears is quite characteristic of this family, in contradistinction to the last, the fact of the Common Seals' limb-construction being such as to prevent them from using their four feet on land is a point of special importance. In the general shape of the body and the appearance of the skin they resemble the Sea Lions more than the Walrus. The fore limbs of the Phocidæ are relatively and absolutely shorter than in the Otariidæ. They are so attached to the body as to leave little else free than the hand. The nails are generally longish and claw-like, and the thumb does not so greatly exceed the other fingers as it does in the Otaries. It is on the hind legs that the main distinction is based. While the thigh-bones are uncommonly short, the leg-bones are relatively long, and directed backwards in a line with the spine, and closely bound to the tail by membrane as far as the heel itself. This mechanical arrangement prevents the leg from being thrown forwards, and therefore it is of no use in land progression. The hind feet accordingly mostly rest in a line with the axis of the body, and when spread out form a kind of broad pair of oars; or the soles approximated give a long rudder or fish-tail-like termination. The tail itself is quite conspicuous behind the heels. The outer or great toe, and the inner or little toe, are almost of equal length, the preponderance being in favour of the former, while the three middle toes are smaller in size, and the nails of all are claw-like. The head in general is rounder than that of the Otaries, the eye is much larger and



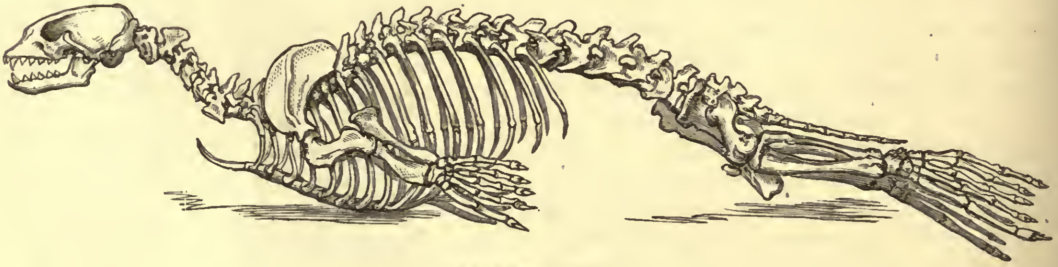
HIND FLIPPERS OF RINGED SEAL. (*Original after Murie.*)
A, opened out; B, closed.

the whiskers somewhat less profuse. Their brain is more spherical. In several minor particulars the skull differs from that of the Otaries, and especially in the dentition is there a marked difference. Three types prevail, of which the Common Seal, the Sea Leopards, and the Crested, or Hooded Seals, are examples. In the first, the dental formula is—Incisors, $\frac{3-3}{2-2}$; canines, $\frac{1-1}{1-1}$; premolars, $\frac{4-4}{4-4}$; molars, $\frac{1-1}{1-1} = 34$. The differences in number and shape in the two others we shall notice in the context. With respect to the skeleton generally, bone for bone, the distinctions rather lie in their relative lengths and dimensions than in special difference of construction. The hip-bones, the hind leg-bones, and those of the fore feet, appreciably differ and correspond to the peculiarities of progression, &c., in the two groups. On land, this family (*Phocidæ*) lies on the belly, throws the hind feet back, and by a series of short jerking movements, so-called saltatory efforts, or a curious kind of dragging motion, grovels abdominally on the ground, the short fore-paws either pressed against the body, or, on rocky rougher ground, otherwise slightly aiding action. This movement of the Common Seal doubtless most people have witnessed, and it is quite unique not only amongst the Carnivora, but the whole of the Mammalia. In swimming, the Seals seldom use their fore feet, while the Otaries use them as powerful sweeps. On the other hand, in the Seals the hind limbs have a kind of sculling movement, comparable to a fish's tail, the sinuous strokes bearing some analogy to those of a screw-propeller. Less swift than the Otaries, they nevertheless move with extraordinary rapidity and power in the water.



TEETH OF COMMON SEAL

In the last family, the Eared Seals, it was pointed out that they had a peculiar geographical distribution, wherein certain forms had alone a northern habitat, and similarly others pertained to a southern. Almost identically, the Earless Seals have northern and southern representatives, but the Elephant Seal ranges both north and south; and the Monk Seal, which, though properly speaking belonging to the northern area, inhabits a strip running east to west within the Temperate zone, indeed nearly approaching the Torrid. It is also worth mention that Van Beneden, Leidy, and others have described quite a number of sub-fossil species, and Phocine genera; though the data for the latter are by no means complete, and probably future researches will considerably modify the conclusions arrived at by these authors. These Seal remains have all been obtained in the Temperate parallel, and regions where the sea no longer flows. In referring to the Earless Seals, as in the case of the Otaries, we shall somewhat follow their geographical distribution.



SKELETON OF SEAL.

THE COMMON SEAL.*—This most familiar species of the group is as ludicrous in its gait on land as it is surpassingly elegant in its movements in water. Its range is widespread, namely, the Black

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* *Phoca vitulina*, the genus *Callocephalus* of some authorities.

Sea and the Mediterranean, and seaboard facing the Atlantic from Spain to Spitzbergen, from Florida along the American coast to Greenland, also near Iceland and Jan Mayen. It likewise abounds on the Scandinavian coasts, and in the Baltic, the British islands being favoured with many visitors. Being a shy, timid, though inquisitive animal, it now frequents the wild, lonely shores of Scotland and Ireland; but in former times even the Isle of Wight and the Cornish coast were famous for the number of their Seals. Still they sometimes visit river-mouths. For example, in 1877, between seventy and eighty large and small Seals, and of different colours, were seen sunning themselves on the sands at low tide at Abertay. Some of these must have gone up the river towards, or even beyond, Dundee, for at West Ferry a desperate and protracted fight between a Seal and a huge Salmon was witnessed, not far from the shore, by several parties. The encounter lasted for more than an hour, the Seal dashing wildly about after its equally agile prey. The Salmon was occasionally tossed into the air, after the fashion of a Cat with a Mouse. Spite of the exertions of the noble fish, it could not escape its pursuer, and at length becoming fairly exhausted, succumbed. The victor frequently rose to the surface with its quivering prey in its mouth ere finally feasting on crimped Salmon.

The Common Seal is of a yellowish-grey colour, spotted above with black and brown, so as to give a mottled appearance, while below it is of a whitish or silvery grey. Ordinarily the hairs are shining and stiff, the colour being dependent somewhat on their being moist or dry; when the former, dark grey predominates. In length it varies from three to six feet, the head being about a tenth part. The roundish head has a short muzzle, prominent whiskers, and large expressive eyes. The skull is distinguished by peculiarities in the shape of the palate and cheek-bones, and by the oblique position of the molar teeth.

Although as valuable as certain other forms hunted by the sealers, its numbers in the Polar regions are comparatively smaller, so that it is not separately pursued by them, though the Greenlanders have a high appreciation of its worth. Dr. R. Brown says the flesh is looked upon as the most palatable of all "Seal-beef," and he further remarks, "that no more acceptable present can be given to a Greenland damsel than a skin of the *Kassigiak.*" Dr. Rink estimates their annual catch in Danish Greenland between 1,000 and 2,000, and he says that the skin is highly valued for making clothes. It is found all the year round on these coasts, though it more frequently dwells near the river-mouths, and hence has been called the Fresh-water Seal. It bears a variety of names, both local and in different countries, and also according to age. In Greenland the young are produced in June. The cub is at first pure white, a few days later becoming darker, and changing as age proceeds. Though very quiet in disposition it can take its own part when attacked, as the reader of Scott's "Antiquary" (Chapter xxx.) may remember, where Captain McIntyre's adventure with the *Phoca* is narrated with Sir Walter's usual graphic power. The same author's lines—

> "Rude Heiskar's Seals through surges dark
> Will long pursue the Minstrel's bark,"

are in reality no poet's licence, inasmuch as many instances are recorded of music—a flute, or even whistling, for example—bringing them to the surface. Their docility and intelligence are noted from the times of Pliny, and Professor Trail relates how one became a regular sociable kitchen pet. Of another, kept for six months in Shetland, the domesticity was quite marked. Called from a distance, even when in the sea, it would answer plaintively, swim ashore, and make its ungainly way over stones and grass to its lodge. This "Sealchie" amusing herself in the sea one day, a sudden snowstorm came on, during which some wild Seals approached and coaxed her off. A great number of interesting stories are related of the Common Seal, which *Phoque* lore, however, I need not stay to consider.

THE RINGED SEAL.*—This animal has considerable likeness to the last, excepting the fact that it is a very much smaller animal, seldom reaching more than three or four feet in length. It is blackish-grey above, the spotting being marked with oval whitish rings. Below, it is paler in colour, and its hair is softer and usually rougher than the Common Seal's. Besides these external features, the formation of the cheek and palate bones, and the straight line of the molar, distinguish it from *Ph. vitulina.* In addition to the above name, it is also called Fœtid and Fjord Seal. It is the

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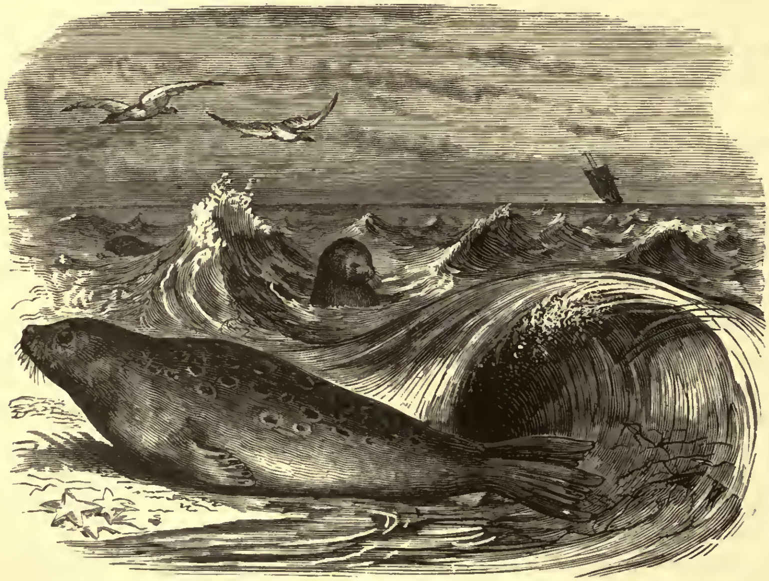
* *Phoca fœtida, or Phoca hispida;* the genus *Pagomys* of Gray.

"Neitsik" of the Greenlanders; "Floe Rat" of the sealers; and is known as "bodack," or "old man," in the Hebrides. Other popular names are given it in different countries. The callous Eskimo are not insensible to the disgusting odour exhaled from the old males, and hence the name *Fœtida*. Dr. Rink says that when the large fellows captured in the interior ice-fjords are brought into a hut, and cut up on its floor, a smell is emitted resembling something between that of assafœtida and onions. The flesh of the young, notwithstanding, both he and Dr. R. Brown aver, is sufficiently palatable to an educated taste; and the latter even states that after a time he and his companions became "quite epicurean connoisseurs in all the qualities, titbits, and dishes of the well-beloved Neitsik. The skin," he goes on to say, "forms the chief material of clothing in North Greenland. All of the οἱ πολλοί dress in Neitsik breeches and jumpers; and we sojourners from a far country soon encased ourselves in the somewhat *hispid*, but most comfortable, Neitsik nether garments. It is only high dignitaries like 'Herr Inspektor' that can afford such extravagance as a Kassigiak (*Ph. vitulina*) wardrobe! The Arctic *pelles* monopolise them all." The young are of white, though slightly yellowish tint, and the hair is curly. A favourite haunt of the Floe Rat is the great ice-fjord of Jakobshavn. They resort to the ice-floes in retired bays, seldom frequenting the open sea. Dr. Rink calculates that 51,000 are annually captured in Danish Greenland. On an average, he reckons their weight at about 84lbs. each. He says this Seal, which is also termed "Utok," is almost exclusively that captured by means of ice-nets. Two nets are used across the track of the Seals near shore, in certain sounds between 63° and 66° N. lat. One is lowered to the bottom, and over this the animals pass; the other intercepts them, and the former is hauled up, and they are then caught in immense numbers between the two, running their heads into the net-meshes. This ruinous slaughter has in many instances driven the "Utok" Seals from their favourite inlets. The Seals form oblique passages through the ice-crust only large enough to allow their getting up and down, and in the sunny days of May are fond of basking on the ice-heaps close by. Towards this hole, usually termed "atluk," equally adapted for rising to breathe or diving again, the Eskimo hunter cautiously approaches, or, covering his face with his Sealskin jacket, imitates the actions and manners of a Seal, and creeps towards his prey. In other cases, with a wooden frame, covered by white cotton, he pushes this shooting-sail slowly before him towards the animal. When sufficiently near, he despatches the creature with his gun, though it is necessary to inflict a severe wound in the skull or neck vertebræ, else the Seal quickly rolls down the hole and is lost. At other times, a couple of hunters will keep watch at the margin of an "atluk," and, while one is on the outlook for the animal's rising to breathe, the other plants his harpoon in the creature, the rope securing the victim. This method of hunting requires great patience, caution, and dexterity, for the acute sense of hearing keeps the animal always on the *qui vive*, and on perceiving the least mischievous stir it instantly escapes.



RINGED SEAL.

The geographical area of this species is round the southern coast of Greenland, Iceland, onwards to Spitzbergen, and high latitudes of the Arctic Ocean, towards Nova Zembla and the Russian coasts. It is also asserted that either this animal, or a closely-allied and barely-to-be-distinguished species.

is that which inhabits Lake Baikal, in North Central Asia, and Lake Ladoga, in Finland. On this head there is some discrepancy in the writings of authorities. M. Dybowski regards the Lake Baikal animal as distinct, and names it *Phoca baicalensis*. Nilsson again avers that the Seal of the Caspian Sea is a distinct species (*Phoca caspica*). On the other hand, Wallace and Van Beneden take a broader view, with which I am inclined to agree, that one, or more likely both, animals may be regarded as the Ringed Seal (*Phoca hispida*). It is very plausibly remarked that in former epochs of the world's history, as is well known, geologists show that a large area of what is now called Russia in Asia was partially submerged, or, at least, the lakes in question were in more direct communication with the Arctic Ocean. The Seals hence, one might say, had their oceanic connection cut off, and thus, on that account slightly modified, remain as evidence of a once different physical condition of the areas concerned.

ESKIMO HUNTERS AT AN ATLUK, WAITING FOR A SEAL.

THE GREENLAND, OR SADDLE-BACK SEAL.*—It is this species that forms one of the chief objects of chase both in the Spitzbergen and Newfoundland seas. In habits it agrees with the ordinary Seals though said to be careless and stupid, and easily captured. It feeds on small fish, crustacea, and mollusca. The males and females differ in appearance, and the changes from the younger to older stages are also very remarkable. Indeed, one may say scarcely two animals are alike. These peculiarities have given rise to a great variety of names—White Coats, Harp Seal, Blue Sides, and other common appellations—besides "Atak" of the Greenlanders, and "Karoleek" and "Neitke" of the Eskimo, &c.

It has a wide geographical range, namely, along the North American coast to Davis Strait, round Greenland, the Scandinavian coasts, the Arctic Ocean eastward to Behring Strait, and even to Kamstchatka. According to Rink, though migratory, it may nevertheless be considered at home on the Greenland coast, on account of its haunting the shore and running over the sounds and fjords during the greater part of the year. There it appears regularly along the southern coast in September, travelling in herds from south to north between the islands. They are then fat, but their blubber still increases towards winter. In October and November they are most numerous; in December they decrease, become scarce in January, and almost disappear in February. In May they return from southwards, and get more northerly in June, when they are very lean. The herds again disappear in July, and return in September. Thus the Saddle-back deserts the Greenland coast twice a year. As to their whereabouts during their absence, information is defective. In spring, early in March, and till the beginning of April, it is found in immense numbers in the proximity of the dreary island of Jan Mayen, and in the Spitzbergen waters, in a belt of ice which the sealers term "South-east pack." To these great broken ice-fields the Seals in vast numbers resort. At such times, as Dr. R. Brown observes, they may be seen, half a million and upwards, of both sexes, "literally covering the frozen waste as far as the eye can reach, with the aid of a telescope, from the crow's nest." At this season, the females give birth to their young—one, or occasionally two, in number. Then it is that the sealing-ships bear up towards the pack-ice; and, whenever opportunity permits, after the young are but a few days old, land and commence their slaughter. As the young increase in strength and take to the water the female parents gradually leave them, and join the males, which have already gone north. In July flocks of Seals, termed by Scoresby "Seals' weddings," have been seen at times in the parallels of 76° and 77° N. lat. Opinions are at variance respecting the migration from the west coast of Greenland towards Spitzbergen, and eastwards; and Rink, at least, holds that the Seals of Baffin's Bay go in the spring down the west side of Davis Strait to Newfoundland and Labrador, where vast numbers are annually killed.

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* *Phoca groenlandica;* the genus *Pagophilus* of Gray.

At birth the Saddle-backs are pure woolly white, this gradually assuming a yellowish tint when they take to the water a few weeks old. They then begin to change to a dark speckled, and afterwards a spotted hue, and are called "Hares" by the sealers. Next they become dark-bluish on the back, while the breast and belly are of a sombre silvery hue. They are now "blue-backs." Getting more spotted, the peculiar saddle-shaped band begins to form as they approach maturity. While in the fifth and last stage, the male acquires that well-developed half-moon-shaped mark on each side, the veritable saddle from which this Seal derives its vernacular name. An adult male is five or six feet long, the female seldom as much. The former is tawny-grey, or with a tinge of yellow or even reddish-brown in the spots, and marked by the saddle or lyre-shaped dorsal bands; hence also the cognomen of Harp Seal. The muzzle and head are dark. The adult female is dirty-white or tawny-bluish, or dark-grey on the back, with widely-distributed irregular spotting, but seldom or never shows the saddles.

SADDLE-BACKS ON THE ICE.

Rink says a full-grown Saddle-back weighs about 250lbs., the skin and blubber over, and the flesh under, 100lbs. The winter blubber may amount to 80lbs., but in summer little more than a quarter of that. In Danish Greenland alone about 35,000 are captured annually. Its skin forms the useful covering of the "kayaks," or Eskimo canoes. The above number is, however, not a tithe of the enormous quantities of these creatures that are each year destroyed in the Greenland (*i.e.*, Spitzbergen), and Newfoundland Seal-fisheries. Of this important branch of British commerce it does not behove us to enter into detail, however interesting or appropriate to the subject. Suffice it to say, now chiefly from Dundee, a fleet of ships and powerful steamers built for the trade, proceed, at the end of February and the beginning of March, with a stoppage at the Shetlands to ship hardy seamen, to the pack-ice in the Arctic Sea. Heavy, dark, and dreary weather often awaits the mariners as they coast along the fields of ice. Into the broken-up floes they now and again push their way, and as fortune wills it they may or may not discover from the mast-head a herd in the distance. Occasionally, even during the night, the noise of a family in these dismal regions will be heard, and the ship is soon made fast to the ice hard by, for the Seals during the breeding season frequent such areas of the ice as enable them to have easy access to the water. Then all becomes activity and excitement on board, every man having an interest and share in the expected plunder. The object is, if possible, to approach unperceived, surround, or get between the animals and the water, and, above all, to secure the young, which are more easily killed, and the more lawful prey. The sealers are provided with spiked clubs, sharp knives, seal-guns, and "ruer-ruddies," or ropes attached by broad belts over their shoulders. Watching their chance the men land in bands, approach cautiously, and commence their dreadful operations. The old Seals abide and guard their young, even endangering their own safety, and will raise themselves up, face, and severely bite the unwary hunter. Crack, crack go the guns, as the older animals endeavour to escape through the holes or towards the water. All and sundry are attacked; a blow of the club, or kick of a heavy sea-boot, despatches the young, while the more aged receive rougher usage ere they succumb. The work of murder goes on apace without stoppage, for once disturbed, no second chance may be allowed the hunter. Told off in batches, some of the men commence the work of skinning, and quickly turn out hide and blubber, throwing aside the (to them) useless carcass, while the skins are heaped in piles. Some collect these, fasten bundles by the rope, and drag them towards the boats, where other sailors are ready to receive them. Thus the murderous operation goes on while there is Seal to be killed, or weather permits the men to remain on the floe, for sometimes the latter will break up, a gale arise, and the poor fellows run even other untold risks. As for the personal appearance of the sealers, as they labour at the work of slaughter, they look the most ruffianly set of men in existence. They are dressed in the queerest caps and coats of various shapes, with smuggler-looking breeches and long boots; moustaches and beards are covered with a mass of frozen tobacco-juice, hoar-frost, and Seal's blood. Their matted hair, gory, greasy, unwashed faces and hands, reek and smell with a strong taint of butchery. In truth, a spectator, seeing the lot, might almost fancy himself back amongst some of the old bloodthirsty pirates of the Spanish Main. However, they work very hard for their hire. The hides are dropped pell-mell into the hold, and as soon as suiting time arrives, the blubber is sliced off, the skins roughly salted, and in this condition the material is retained for the few weeks until their voyage leads the "fishers" home again. Arrived at Dundee, the cargo is quickly landed, weighed, and the materials placed in the hands of the skinner. The fat is cut up by a variety of cutters driven by steam, and then steamed to facilitate the rendering of the oil. The greater part of the oil thus obtained is tasteless, inodorous, and pure as water. The remaining blubber, after the first oil is taken off, is placed in bags and pressed, and from these pressings most of the brown and inferior quality of oil is had. The former is by far the more valuable. Seal-oil has, of course, varied considerably in price during this century, in 1876–7 averaging £32 a ton, the inferior sort less in proportion. With regard to the skins, these, after being soaked, and the salt got rid of, pass through the usual tanning processes. Relative absence of under-fur gives value only to the leather. Roughly speaking, they fetch five to six shillings apiece.

THE BEARDED SEAL.*—About this animal there seems to be a certain amount of ambiguity, or want of agreement among naturalists, whether more than one species be not included under the *Ph. barbata* of Fabricius. This missionary refers to the "Ursuk," the big, fat, or great Seal of the Greenlanders. The Russian naturalists Steller, Pallas, and Middendorf, speak of a Seal by different appellations, but most evidently this animal, as inhabiting the neighbourhood of Behring Strait and Kamstchatka. Schrenck and Temminck refer to it as being found, the former on the coast of Amoor land, the latter in Japan, where its skin is sold as an article of commerce. The Leporine Seal of Pennant may be regarded as still another synonym of the same creature. If such be the case, this great Bearded Seal has a geographical range from the west of Greenland to the Sea of Japan, an area somewhat corresponding to that of the Saddle-back, though less spread in the North Atlantic. Rink alludes to it as the "Thong Seal," the Eskimo cutting the skin circularly into a long strip, which "allunak," or hide rope, they use for harpoon lines. About 1,000 are captured annually on the Greenland coast. Dr. R. Brown regards it as the "Ground Seal" of the Spitzbergen sealers, and says that the blubber is most delicate in taste, and most highly prized as a culinary dainty. Unlike the other Seals, it has no "atluk," but depends on broken places in the ice. It is generally found among loose ice and breaking-up floes. Its great size, occasionally ten feet long, and bulky body in proportion, is its important feature. It is of a tawny colour, darker above, and the young is supposed to be of a lighter hue.

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* *Phoca barbata.*

The Grey Seal.*—Its range is a limited one compared with that of the last. It frequents the British coasts, especially Ireland and the Hebrides, and from the Scandinavian coast it stretches towards and round the southern shore of Greenland. It also is of enormous size. One old male, shot in 1869, at the Eagle Rock, Connemara, Mr. A. G. More states, weighed nearly 400lbs., was eight feet long, and had a girth of body over five feet. Its colour is yellowish-grey, lighter beneath, with varied dark grey spots and blotches. Fabricius first described it, and the Swede Professor Nilsson ranked it as a separate genus, the distinguishing characters depending on the form of its skull and molar teeth, small brain-case, and large nasal orifice, the muzzle being deep and obliquely truncated. To Mr. Ball, of Dublin, we are indebted for a tolerably good account of its habits and other particulars, he having shown it to be the same as Donovan's Orkney Seal, the so-called *Ph. barbata.* In bringing the matter before the British Association in 1836, Professor Nilsson recognised it as his *H. griseus,* the same animal described by Fabricius in 1790. On the British coasts it breeds in October and November, though Nilsson asserts that on the Swedish coasts it breeds in February, a contradiction hitherto not clearly explained. A male and female from Wales were exhibited in the Zoological Gardens in 1871, and Mr. Bartlett particularly noted that it was both greedy and savage as compared with the other Seals under his charge. This accords with Mr. Ball's account, who found it insusceptible of domestication; this he attributed to its small brain relatively to the other Seals. At the mouth of a cave at Howth he was fortunate in harpooning one. Some state that they are solitary in their habits, others that they associate in pairs, and still others that they congregate in groups of ten or a dozen. At all events, they select such remote and unfrequented situations that it is no very easy matter to follow them. They are not so lively, watchful, or timid as the Common Seal. Those of the county Galway are said to utter most dismal howls in chorus. Their young they leave on the exposed barren rocks, and suckle them every tide for the space of a fortnight. When born, they are of a dull yellowish-white, in a few weeks becoming darker, and by degrees gaining their greyish coat. Under the name of Black Seal, probably this species, an animal (besides the Common Seal) occasionally frequents the Bay of St. Andrews and the Tay mouth, where it is very destructive to fish and nets.

The Monk Seal.†—Who has not heard or seen something of the "wonderful learned talking fish," if only from placard or fanciful sketch hung outside the showman's caravan, with the occasional attractive announcement that "the amphibious creature has the sense of hearing in its nostrils, and fins bearing the impression of five fingers?" A visit soon dispels the illusion, as the imploring look of a hungry but bright-eyed Seal in a tub of water greets the sight. These "talking fish" generally belong to this species, and have often been exhibited in Britain and on the Continent. A full-grown animal reaches between seven and eight feet long, and upwards. It is dark-brown mixed with grey above, and whitish below, and has short hair and small claws. It entirely differs from all the preceding in being confined to the Mediterranean and Black Seas, and the African coasts neighbouring Madeira and the Canaries. Buffon's classic description of the White-bellied Seal refers to this species, and Pennant names it the Pied Seal. Its geographical limits are as above stated, unless it be the same as a Seal from Jamaica, which Gray terms *M. tropicalis,* in which case it would traverse the Atlantic, a fact that is more than doubtful. Their mild disposition and teachable nature have led to their frequent exhibition. They go through many tricks, utter sounds construed into speech, present the fore-paw to "shake hands," kiss the visitor when desired, obey other trifling commands, and allow themselves to be freely handled. Little is known as to its times of breeding and rearing of young, though its habits in a state of nature are believed to be very similar to those of the Seal tribe generally.

The Crested, or Bladder-nose Seal.‡—The geographical range of this animal agrees best with that of the Common Seal, that is, it sweeps along the North American coast from Florida right up into Baffin's Bay, thence to the south coasts of Greenland, across the North Atlantic, skirting Britain and Scandinavia, to Spitzbergen. Named from the remarkable prominence of the front upper part of the head, this is one of the largest and most powerful of the Northern Seals. Certainly it is the fiercest and most dangerous, as the Eskimo know to their cost in attacking it from their kayaks. It does not hesitate to return an assault, and the crest, it is said, affords some protection from wounds inflicted by the club. These brutes fight ferociously among themselves, and the roaring during such ice-battles, in the still Arctic regions, is said to be audible four miles off. The so-called crest, hood, or bladder, is in reality nothing of the sort, but only a peculiar enlargement of the nasal passages, more particularly developed in the old animals of both sexes. The configuration of the head of this creature is hemispherical, and proportionally broad and short. The bony parts of the snout, and the cartilaginous septum of the nose and nostrils generally, are so formed as to allow great dilatation of these parts. That is to say, the two passages of the nostrils are, in the full-grown animal, exceedingly capacious fleshy tunnels.

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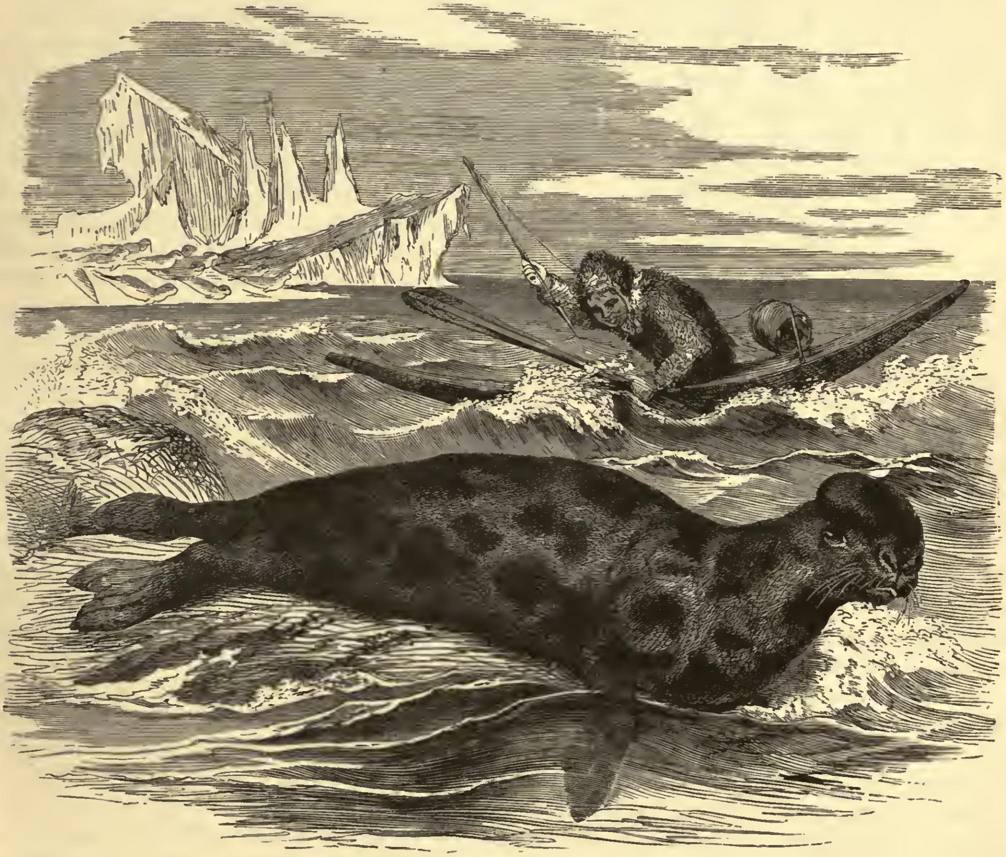
* *Halichœrus gryphus.*

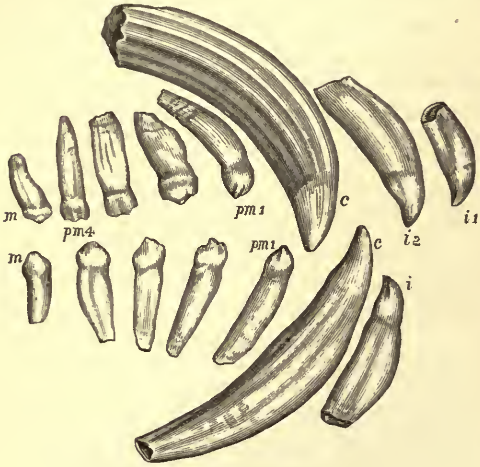
† *Monachus albiventer.*

‡ *Cystophora cristata.*



CRESTED SEAL.

From youth onwards, this region acquires prominence, and, partly through habit and growth of the structures in later life, the animal when roused inflates, by compression of the muscles of upper-lip and nose, the cavities in question, so much so as to produce the expansion on the forehead which has given rise to its specific *soubriquet*. All engravings, even our own, represent this structure as reaching farther back on the head than the absolute anatomical conformation of the parts warrants, but in the live animal the skin of the head rearwards to some extent swells in unison with the puffed nostril, and hence to a certain degree simulates a hood or crest. Some sealers regard the so-called bladder as an air reservoir for buoyancy, an idea totally at variance with its true nature. The teeth of this genus are peculiar, the incisors being fewer in number. The formula is—Incisors, $\frac{2-2}{1-1}$; canines, $\frac{1-1}{1-1}$; premolars, $\frac{4-4}{4-4}$; molars, $\frac{1-1}{1-1}=30$. From eight to twelve feet in length has been given as the limits of size it obtains. The young are pure white; when a year old they become greyish, and the hue deepens, becoming deep chestnut and black above, though the lighter shade is retained on the under parts; chiefly on the back are black spots and rings of white. The muzzle is hairy, and the hair on the rest of the body long, with thick soft under-wool. It visits Greenland in May and June, leaves in July, and again returns in August and September. Fabricius states that they are polygamous. This animal is one which the sealers hunt, it frequenting the outside of the ice-packs. Rink estimates the average annual catch in Greenland at 3,000. An individual will yield 120 lbs. of blubber, and as much as 200 lbs. of flesh.



TEETH OF THE CRESTED SEAL.

THE ELEPHANT SEAL.*—This creature, like the last, has a peculiar geographical range, but is unique, inasmuch as it is found north and south of the equator. It should, however, be stated that Dr. Gill has designated the northern form by a separate name (*Macrorhinus angustirostris*), though the distinctive characters have as yet not been substantiated by other naturalists. Meantime, we may be justified in regarding them as one form. It existed formerly in numbers on the Californian coast. But it is best known as frequenting, during the beginning of this century, such islands as Juan Fernandez, the Falklands, New Georgia, South Shetlands, Tristan d'Acunha, Kerguelen's Land, and, indeed, several of the islands scattered in the Antarctic Ocean. In the young and females, the characteristic feature, or so-called proboscis, is deficient, but in the old males it extends quite a foot beyond the angle of the mouth, and hence the name of Elephant Seal. The females are nine or ten feet, the males fourteen, sixteen, and even twenty feet in length. The colour varies with age from brown to leaden-grey. It seems that they bring forth their young at different seasons in the southern and northern latitudes, in the latter about May or June, in the former somewhat earlier. Accounts differ as to its food, some saying cuttle-fish and seaweed are its principal nutriment.

Lord Anson, Captain Cook, and M. Péron, each give accounts respecting its extraordinary abundance in southern regions, but their numbers have since been decimated. Captain Scammon describes them as crawling out of the surf towards the ravines half a mile distant from the water, where they congregated in hundreds. Unless when excited, their movement on land is slower than that of the ordinary Seals, but they ascend broken elevated ground fifty or sixty feet above the sea. He says that when sailors are destitute of tobacco-pipes, they hollow its short canine teeth into bowls and use the quills of the Pelican for shanks. Their hunting in Desolation and Herd's Islands is a most exposed and solitary pursuit. The ship is manned with a double crew, and some of the men are landed on the dangerous, ever-stormy coasts of these islands. Food and necessaries are provided, and rude shanties erected of rough boards, tarred canvas, and pieces of lava-rock. In this dank habitation, planted between an iceberg on the one side and a bluff volcanic mountain on the other, they are left to hunt as best they can, in a climate windy, rainy, cold, and often snowy. Nevertheless, undergoing hardships and privations of no common kind, excitement and prospect of gain compensate for their fatigues and temporary banishment. By the flickerings of a murky oil lamp, and fat and coal diffusing heat, these reckless adventurers pass the long, dreary, cold, evenings in card-playing and boisterous fun. Sea Elephants' tongues and water-fowl are gladly intermingled with coarser fare. The men divide themselves into groups, and scour the coast in all directions, killing such numbers as fall in their way. They either transport the blubber and skins to their stores, or bury it for a time until opportunity of its removal is afforded. Afterwards it is placed in casks, and these are rolled by the gangs to the beach, when their vessel arrives. The casks are then launched into the surf, pulled through the rollers by the boats to the ship, where they are duly stowed. In the Californian district, the skin of the animal is ripped up along the back and reflected; the blubber is cut into "*horse-pieces*," about a foot square, and a hole made through which a rope is passed. The pieces are again strung on a raft-rope, a line is made fast to this, when they are dragged

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* *Macrorhinus elephantinus;* the genus *Morunga* of Gray.

ELEPHANT SEAL.

through the breakers to the small boat, and towed to the vessel. On board, large pots set in a brick furnace are ready prepared, where the blubber is rendered, the oil extracted being very superior for lubricating purposes. In these voyages the crews, unlike the Dundee fishers, hunt both Seals and Whales at the same time, the Americans having quite a monopoly of this special trade.

Ross's Large-eyed Seal.*—In the voyage of the *Erebus* and *Terror* to the Antarctic regions, 1839–43, there was obtained a Seal named after the commander of the Expedition. Little or nothing is recorded of its special habitat and habits, the main peculiarities resting in its skeleton. The stuffed skin, now in the British Museum, is of a greenish-yellow colour, with close, oblique, yellow stripes on the side, pale beneath, and the fur is close-set and rigid. The skull is broad, with great orbits. This genus has six molar teeth on each side of the upper and five on each side of the lower jaw. The canines are of very moderate dimensions, and the teeth, as a whole, are relatively small. Its specific name is derived from its great eyes.

The Sea Leopard.†—Under the names Sea Leopard and Leopard Seal, indiscriminately used by the sailors or Southern sealers, two animals, apparently distinct, have evidently been confounded by them as well as by naturalists. Indeed, another seemingly totally different animal of the North Pacific has also been named Leopard Seal by Scammon. That to which the title Sea Leopard appears most applicable is what De Blainville and others called the Small-nailed Seal (*Phoca leptonyx*), and F. Cuvier the Narrow-muzzled Seal (*Stenorhynchus leptonyx*). Its precise distribution is uncertain, but it has been found on the coasts of Australia, New Zealand, Falkland, Campbell, Auckland, and Lord Howe's Islands, and the Antarctic Ocean (on pack-ice). It may possibly be met with elsewhere, but the foregoing are authenticated localities. Mr. A. W. Scott describes male and female stuffed specimens in the Sydney Museum. The old male measures twelve feet in length; the glossy spotted skin is of a light silvery grey, with pale yellowish-white in patches, brought into relief by black-grey shading; its back and sides are darker, and belly lighter. The younger but adult female is seven feet long. Her colour above is darkish-grey, almost black in the middle line, intermixed by narrow markings of darker hue, and of yellowish-white, and the under parts without spots and also yellowish-white. A specimen kept alive for several days at Port Jackson had a long muzzle, a long thin neck, and in its habits generally it resembled the Seal tribe. Dr. George Bennett killed a male in Shoalhaven River (August, 1859), several miles above salt-water reach, which had a water-mole in its stomach. Dr. Knox states that those he examined in New Zealand contained in their stomachs fish-bones, gulls' feathers,

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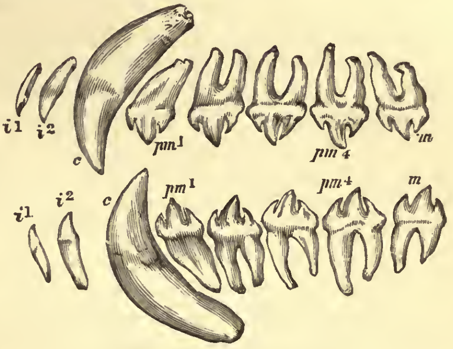
* *Ommatophoca Rossii.*

† *Stenorhynchus leptonyx.*

SEA LEOPARD SEALS.

and seaweeds. Captain Musgrave, in his forced residence on the Aucklands, already referred to, alludes to this animal as the Black Seal, and describes a fight between one and a Sea Lion (*Otaria*); the flesh, he says, is rank. So far as his observations go, they remain at these islands pretty nearly all the year round, but others think that they occasionally migrate, or, at least, at certain seasons less frequently approach the land. The skull is remarkably elongated; the double-rooted molar teeth are compressed and serrate, or have a three-lobed crown, the middle being the longest. This animal has but four incisors above and four below, and the canines are of moderate dimensions. The nails on the hind feet are almost absent.



TEETH OF THE SEA LEOPARD.

Weddell's Seal.*—A couple of stuffed specimens and a few skulls of this Seal in the British Museum, and a stuffed specimen in Edinburgh, are the sole material on which this species is founded. Dr. R. Hamilton, in the "Naturalist's Library," described the latter as the Leopard Seal (*Phoca leopardina*, Jameson). Captain Weddell had brought it from the Southern Orkneys, and, according to him, during life the animal is pale greyish above, yellowish beneath, and the back spotted with pale white. Dr. Gray mentions the London male specimen as fulvous, with a blackish-grey line down the back, the female and young corresponding to Captain Weddell's description. The distinction between this and the last species is barely appreciable from their external coat, such differences as exist being in the skull. Weddell's Seal, or, as Gray names it, the False Sea Leopard (*Leptonyx Weddellii*), has a relatively shorter and broader skull, fuller in the brain-pan, largish orbits, and a weak lower jaw. The molars are not tri-cusped; the front one in each jaw is single-rooted, and the rest double-rooted. The Antarctic Expedition brought home skulls, and skins and skulls were afterwards obtained by Captain Fitzroy, R.N., from the River Santa Cruz, Patagonia. Neither they nor Weddell give us any information respecting the life-habits of this animal. It will thus be seen that its geographical area, and especially its geographical relations towards the previous species, are at present uncertain. On account of the peculiarities of cranium and dentition, Gray forms it into a separate genus.

The Crab-eating Seal, or Saw-tooth Sterrinck of Owen.†—The interest in this creature lies probably not so much in the nature of its food as in the greater saw-like character of its molars, which strongly resemble those of the fossil Zeuglodon, an animal of the Whale tribe. The Crab-eating Seal inhabits an undefined area of the Antarctic Seas. Above it is of a nearly uniform olive colour, below and the sides of the face yellowish-white, and there are a few often confluent spots of a light colour on the flanks. The five-toed fore feet, whose wrist is said to be very short, are clawed, but the hind ones are clawless. In number, the teeth agree with the Sea Leopard's; though the first, second, and third front upper and the first front lower molars are single-rooted, the rest double-rooted. Moreover, nearly all the molar teeth have two or three cusps behind the middle strong conical lobe, while in front there is usually only a single small conical elevation. Thus the hinder border of these molars is considerably more saw-like than in the Sea Leopard. It differs also from the latter both in the lower jaw and upper parts of the cranium, but more particularly in the nasal and facial regions. Little is known with regard to its life-history.

The last three Seals some have considered under three distinct generic names, for reasons already given. If importance be attached to the dentition, this separation is allowable; but on the other hand there are considerable resemblances which others regard as only of specific weight. The generic term *Stenorhynchus*, first used by F. Cuvier in 1824 for the so-called Sea Leopard, and which has been at times indiscriminately applied by different naturalists to all three animals with multi-serrate crowned teeth, but here partially restricted to the first two, is a name well known and still applicable to one or other. Nevertheless, Lamarck, in 1819, had designated a genus of Crabs

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* *Stenorhynchus (Leptonyx) Weddellii.*

† *Lobodon carcinophaga.*

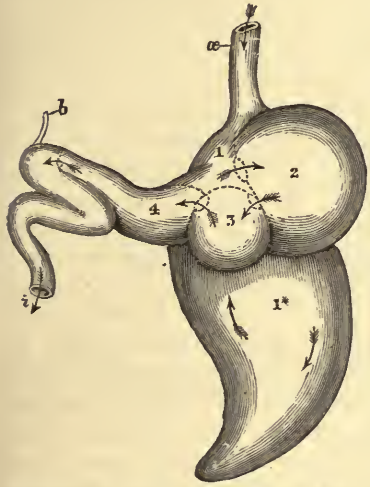
Stenorhynchus, universally accepted, and also in current use up to the present time. Some confusion having thus occasionally resulted, Professor Peters drew attention to the awkwardness of the circumstance, and proposed that the term *Ogmorhinus* should replace *Stenorhynchus,* as applied to the Seals; Lamarck's name having priority being retained for the Crabs. This well exemplifies one among the many difficulties and cross-purposes incident to nomenclature, &c., of Natural History, where, in the vast array of names and facts presented, glaring discrepancies will arise, despite the constant revision of those devoted to its study.

Before closing this chapter, there is one subject which I believe deserves mention, however briefly. The enormous slaughter of the Seal tribe is a matter of serious consideration, if only in a mercantile spirit. Among the sealers, neither sex nor age is spared, and therefore at the present wholesale rate of destruction it is easy to foresee early comparative, if not absolute, extinction of the tribe. Nothing can be clearer than the fact that since the Americans in their Alaska territory have adopted the plan of killing a prescribed number annually of the young and male Seals only, in other words, of protecting the breeding females, the Fur Seals have shown no tendency to diminution, but rather an apparent increase. Nature has her limits, and the Seals have other enemies to contend with besides man. Yet the latter, taking advantage of the maternal affections, and with the aid of deadly firearms and the like, in a certain space of time commits more fatal havoc among them than all their other foes combined. Several persons have urged a close-time. The fact is there are great difficulties in the way of this, for even in well-protected British rivers and fisheries generally, Salmon and others of the finny tribe are caught at forbidden times, in spite of Acts of Parliament and other regulations. Who is to watch the sealers in far-off inhospitable climes? Certainly in the Northern sealing-grounds the departure of the ships could be made somewhat later, as has, indeed, to some extent been done, but of course at the risk of a diminished catch. In the long run beneficial results doubtless will follow. But the plan most applicable to both Northern and Southern Seal-capture would be the insistance of the simple rule of *sparing the breeding females whenever possible.* If our merchants at home would take the matter in hand, and, but for a few years, refuse to receive female skins, the sealers would be practically forced, and in fact find it to their benefit, to look to their interests from a more humane point of view.

James Murie.

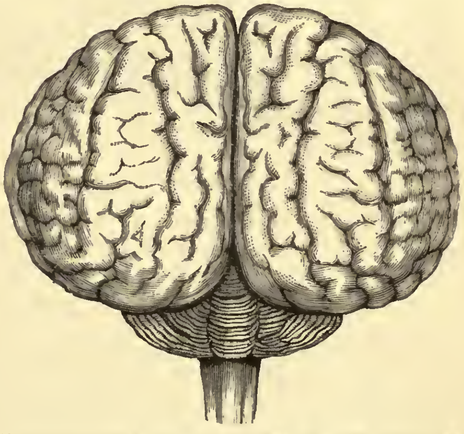
ORDER CETACEA.—WHALES.

Whales—Vulgar Notions—Characteristics External and Internal—Larynx—Tail—Skeleton—Classification—THE TOOTHED WHALES—Zeuglodons—Squalodons—Phocodons—River Dolphins—Susu, or Gangetic Dolphin—Description—Habits—Teeth—Inia—Pontoporia—Ziphioid Whales—Cuvier's Whale—Van Beneden's Whale—Sowerby's Whale—New Zealand Berardius—Bottlehead, or Common Beaked Whale—Sperm Whales, or Cachalots—Sperm Whale—Description—Range—Fishery—Incidents of the Chase—Habits—Harpooned—Treatment of the Carcass—Short-headed Whale, or Snub-nosed Cachalot—Dolphins—Caaing, or Pilot Whale—Risso's Grampus—Common Porpoise—Killer Whale, or Orca—Ferocity—True Dolphins—Common Dolphin—Bottle-nose Dolphin—White Whale—Narwhal—THE WHALEBONE WHALES—Whalebone—Greenland, or Right Whale—Biscay Whale—Japan Whale—Cape Whale—South Pacific Whale—Description of the Greenland Whale—Their Food and Mode of Feeding—Habits—Hunting—Treatment of Carcass—Hump-backed Whales—Fin Whales, or Rorquals—Sibbald's Rorqual—Sulphur-bottom Whale—Common Rorqual, or Razor-back—Lesser Rorqual—Concluding Remarks.



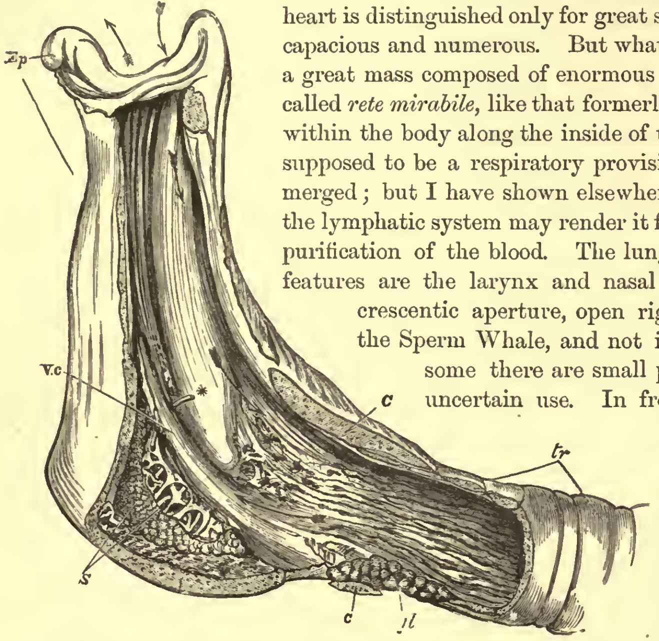
STOMACH OF PILOT WHALE. (*After Murie.*)

œ, œsophagus, or gullet; *b*, bile duct; *i*, intestine; 1, 1*, 2, 3, 4, represent the various chambers, the arrows denoting the direction food takes in passing onwards.



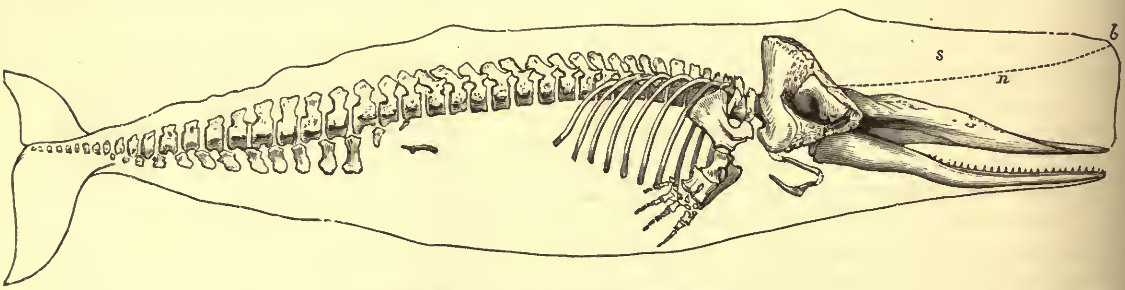
UPPER SURFACE OF THE BRAIN OF THE PORPOISE. (*After Leuret* and *Gratiolet.*)

The Whales form one of the most extraordinary groups of the Mammalia, for they are warm-blooded, air-breathers, and sucklers of their young, and are most strangely adapted for life in a watery element. Oddly enough the term "Fish" is still applied to them by the whalers, though they have nothing in common with these creatures save a certain similitude in shape. The vulgar notion of a Whale is an enormous creature with an extremely capacious mouth, but the fact is that many of the Cetacea are of relatively moderate dimensions, though doubtless, on the other hand, the magnitude of some is perfectly amazing. Thus, in size they are variable as a group, a range of from five or six feet (equal to the stature of man) to seventy or eighty feet giving sufficiently wide limits. With certain exceptions, notwithstanding length, an average-sized Whale by no means conveys to the eye the same idea of vastness, say for instance, as does an Elephant. The reason is that most Cetaceans are of a club shape, the compact cylindrical body and long narrow tapering tail reducing the idea of size. The head is in such continuity with the body that of neck there seems nothing. In some there are upright fleshy back fins; in others these are wanting. The gristly caudal fin is horizontal and not upright or rayed like a fish's. The body is smooth and devoid of hair. The eye is remarkably small and without eyelashes, and the ear orifice is so diminutive as to seem deficient. The head is either rounded, massive, or has a long snout. There are no hind limbs, and only in the enormous Whalebone Whales have the rudiments of any been found. Small pelvic bones, however, are present, embedded in the flesh at the setting-on of the tail. The fore-limbs, which are ordinarily termed flippers, have the usual bones extremely broadened and flattened; the free part—equivalent to the hand—being encased in a rigid or stiff nailless membrane; and in a few instances the phalanges are exceedingly numerous, producing a long-fingered peculiarity met with in no other Mammal. The two mammæ adjoin the pelvic bones, the nipples being sunk in slits. In one section only, the Mysticete, is the mouth very large. In them great plates of the so-called whalebone, a horny substance, occupy the place of teeth. In another section, the Denticete, with moderate-sized mouth, teeth are present in few or greater numbers. These are implanted in simple sockets without successors—*i.e.*, there is no milk and adult dentition as in the foregoing orders. The tongue cannot be thrust out. The gullet is narrow in some, and wider in others, but the stomach in all is peculiar, and composed of three or more chambers with narrow passages between; in this respect corresponding to that of Sheep and cattle. The intestines are long, glandular, and full of little pouches. There is no gall-bladder. The brain is of considerable calibre, globular, and remarkably convoluted. The heart is distinguished only for great size, and the blood-vessels are exceedingly capacious and numerous. But what is remarkable in the vascular system is a great mass composed of enormous numbers of minute tubes, forming a so-called *rete mirabile,* like that formerly described in the Lemurs. It is situated within the body along the inside of the spine. This, in the Whales, has been supposed to be a respiratory provision to enable them to remain long submerged; but I have shown elsewhere that its connection with the glands of the lymphatic system may render it functionally subservient to nutrition and purification of the blood. The lungs are large, but the most extraordinary features are the larynx and nasal passages. The nostrils, often a single crescentic aperture, open right on the top of the head, except in the Sperm Whale, and not in front as in all other Mammalia. In some there are small pouches near the orifice or blowhole of uncertain use. In front of the larynx of man we all know there is an elastic lid, the epiglottis, which folds over and protects the air-passage as food is swallowed. The side cartilages constitute the walls of the organ of voice, and protect the vocal cords. Now, in the comparatively voiceless Whale the cartilages including the epiglottis form a long rigid cylindrical tube which is thrust up the passage at the back of the palate in continuity with the blowhole. It is there held in place by a muscular ring. With the larynx thus retained bolt upright, and the blowhole meanwhile being compressed or closed, the Cetacean is enabled to swallow food under water without the latter entering the lungs. Respiration, "blowing" or "spouting," takes place at intervals as the animal reaches the surface, and the volume of air thrown up along with surrounding moisture and condensed vapour in some rises in a great jet. The flesh of the body terminates in long cords of tendon running to the tip of the tail. These tendons, like a telegraphic cable, bound together in the smallest compass, are moved by the enormous fleshy masses of the body, and thus their vast force is conveyed to the caudal appendage, whose great power as a propelling agent (and even a destructive one) enables the Whales to be truly roamers of the sea. Save the tail and flippers, the body is covered by a dense layer of fat, the blubber. In the skeleton the neck-bones are often soldered into one or two separate pieces, rigidity being needful in front, while the



INTERIOR VIEW OF LARYNX OF RISSO'S GRAMPUS. (*After Murie.*)

Ep, epiglottis; *vc*, vocal cord; *s*, sac; *c*, cartilage; *gl*, gland; *tr*, trachea. The arrows show direction of air-currents in ingress and egress.



SKELETON OF SPERM WHALE. (*After Flower.*)

s, Spermaceti Cavity; *n*, Nasal Passage, in dotted line; *b*, Blowhole.

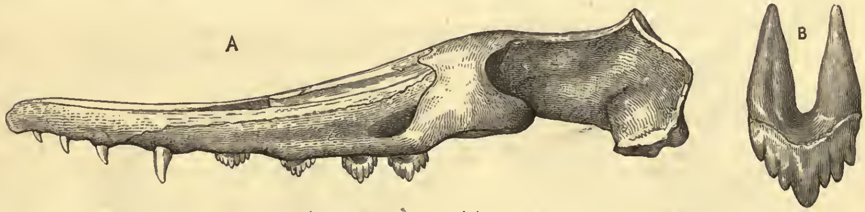
remaining vertebræ, tapering to exceedingly small bones in the tail, are each separated by thick elastic fibro-cartilaginous cushions, thus giving great flexibility behind. The breast-bone is often in a single flat piece. The skull is greatly modified and by no means uniform throughout the group. Among the Dolphins and others (Delphinidæ) it is strangely distorted, so that the one side does not agree with the other. The upper jaw-bones (*maxillæ*) and the pair of bones above and between them (*premaxillæ*) are unusually produced, and this production in front, with corresponding extension of lower jaw, gives a lengthened facial region and snout accordingly. The bones surrounding the occiput and brain-pan are directed upwards, the former occasionally forming a great horseshoe crest. The bony nasal passages instead of coming forward lead nearly direct upwards towards the summit of the cranium, nasal bones themselves being all but absent. The orbits are often small and open behind. Curiously enough, though deficient in ears, the interior tiny ear-bones of other Mammals are in the Whales great massive structures and exceedingly dense, so much so that they are frequently preserved fossil when other osseous structures are destroyed.

Cetacea have been a troublesome group to unravel, being ocean-dwellers, and many of them huge brutes. To study them in the live state has been difficult, and their carcases when captured or stranded on shore are as unmanageable for purposes of examination. As to their classification the two sub-orders—Denticete, Toothed Whales, and Mysticete, Whalebone Whales—are universally accepted. As regards the families, the main groups are tolerably well agreed upon, though differently named by authorities. Among the sub-families, the genera and the species, there is less unanimity. The grouping of the living forms proposed by Professor Flower is in Great Britain more frequently adopted, while MM. Gervais and Van Beneden, in their great work on "Osteographie des Cétacés," have collated the living and fossil forms. Some species and genera of Whales are restricted within given areas, as are the Seals, but of the habitat of many others in truth so little is known that no defined limit can be assigned. The great majority are migratory; some are gregarious, others more solitary in disposition. A few are quite fluviatile; but most are found in the high seas. Following the above primary divisions, we give precedence to

THE TOOTHED WHALES (DENTICETE.)

Except the possession of teeth, no other available common character need here be given.

THE SEAL-TOOTHED WHALES (PHOCODONTIA OR ZEUGLODONTIA).



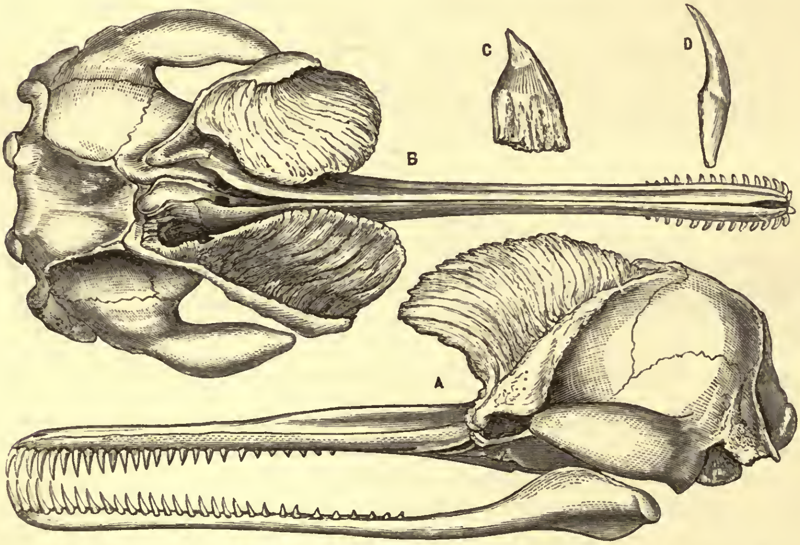
RESTORATION OF SKULL (A), AND TOOTH (B) OF ZEUGLODON. (*After Gaudry.*)

We begin with these, as they are supposed by some authorities to be intermediate between the Seals and Whales. This extinct family, judging from the various mutilated remains found, comprised several different genera. The most notable of these are Zeuglodon, Squalodon, and Phocodon. The Zeuglodons may have attained a length of fifty or sixty feet. Their vertebral column was cetacean in character, but the neck-bones were separate, though considerably flattened from before backwards. Some assert that their skull bore resemblances to that of the Seals in several respects. Their brain-cavity undoubtedly was remarkably small, and relatively less than that of known Whales; but the supposed Seal-like skull structure is open to question. The teeth were of two kinds: those in front being conical, pointed, and lengthened; and those behind laterally compressed, serrate, and double-rooted. The dental formula is stated to have been—Incisors, $\frac{3-3}{3-3}$; canines, $\frac{1-1}{1-1}$; molars, $\frac{5-5}{5-5} = 36$. Hind limbs may have been absent, but the fore limbs suggest rather than furnish precise data showing approximation to the Seals. The Squalodons are known chiefly from the skull, which, as a whole, has strong resemblances to those of the curious Amazon Dolphins, called Inia and Pontoporia, but the dentition, however, agrees rather with that of the Dolphin of the Ganges, *Platanista*. They possessed a long, narrow snout, but no special crest on the summit of the head, and the blow-holes were situate as in the foregoing three last-mentioned living genera. Van Beneden has given the following formula of the dentition:—Incisors, $\frac{3-3}{3-3}$; canines, $\frac{1-1}{1-1}$; molars, $\frac{11-11}{11-11} = 60$. Their teeth in most respects resembled those of the Zeuglodons. Much less is known of the **Phocodons**, our information regarding them being chiefly derived from the teeth. These latter were not unlike the rearmost of those of the Zeuglodons and Squalodons. The Zeuglodons have been found in the Eocene and Miocene strata of North America. The first remains from Alabama were considered by Dr. Harlan to be those of an enormous reptile (*Basilosaurus*), but Professor Owen proved their Mammalian character from the teeth being implanted in distinct sockets. The Squalodons and the Phocodons have not only been found in the United States, but in Australia, and in France, Belgium, Austria, Italy, and England. Of course nothing is known respecting their habits other than what may be legitimately inferred from their skeletal peculiarities. To all intents and purposes, so far as we know, the balance lies in favour of their having had the habits of Whales. They may have been river-frequenters, and judging from the dentition their food would be similar to that of the Ganges and Amazon Dolphins.

THE RIVER DOLPHINS (PLATANISTIDÆ).

Three living forms come under this heading, which, however, barely present such characters in common as to render them a compact group; and some authorities even incline to regard them as representative of sub-families. As in the Seal-toothed Whales their neck vertebræ are separate.

The Susu, or Gangetic Dolphin.*—This remarkable Cetacean is never found in the salt water, or at best only in the brackish water of the Sunderbunds; its habitat being the rivers Ganges and Indus from their mouths upwards, and their various tributaries almost to the mountain ranges in the north. Specimens have been got at least 1,000 miles beyond Calcutta. It measures from six to twelve feet in length, and in colour is entirely sooty black. Its long body has a moderate girth, and just behind the middle of the back there is a slight elevation which can barely be called a fin. The tail is broadish; the flippers are short, very broad, fan-shaped, and not pointed as in most Whales. The head is globular, with a long, narrow, spoon-shaped snout. The opening of the blow-hole, unlike that of other Whales, excepting the Inia, is not transverse, but a single longitudinal slit. The eye externally, situated above the angle of the mouth, is so diminutive as barely to be visible. We may compare the Susu to the Mole in this respect, for in an adult eight feet long the whole of the eyeball is no bigger than a pea in size. Small though this eye is, nevertheless it is perfect in lens and humours, &c. The ear-orifice behind the latter may be compared to a pin-hole. The narrow rostrum of the upper and of the lower jaw is implanted with a series of teeth, more pointed and conical in front, and narrower and laterally flattened in those behind. In the young animal the difference between the



SIDE (A) AND UPPER (B) VIEWS OF SKULL; (C) REARWARD AND (D) FORWARD TOOTH OF YOUNG OF GANGETIC DOLPHIN. (*After Gervais and Van-Beneden.*)

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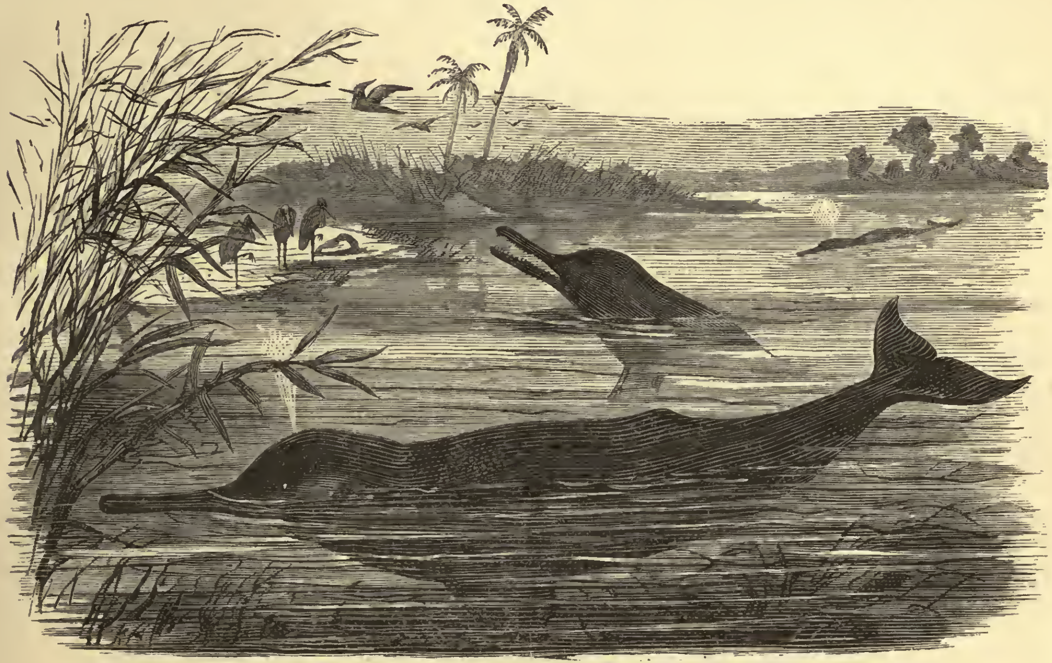
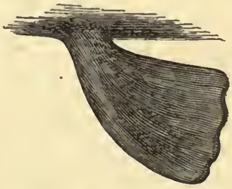
* *Platanista gangetica.*

anterior and the posterior teeth is exceedingly marked in size, the former being very long, the latter very short, while as age advances quite the reverse is the case. The back teeth also wear down very considerably in the crown, and increase in breadth in root-substance; indeed, as Dr. J. Anderson has shown, the true dental material is worn away, and finally nothing but bone is left. The head of the male is about two-thirds the length of that of the female, and in both its point is slightly upturned. The apparently rounded skull behind the snout has broad thick zygomatic arches, and above and in front of these the cheek-bones (*maxillæ*) each send forwards and inwards a great roughened sheet of bone or crest, which forms a kind of open helmet. In the large hollow between these bony plates, and somewhat behind, are situated the nasal orifices, which are slightly awry.

The Susu frequents the deep reaches and creeks of the river, occasionally coming to the surface to blow, and although often heard are but seldom captured. Ordinarily their movements are slow, but at times they seem exceedingly active. Their food is chiefly fish, shrimps, &c., which they grovel for among the mud, something like Pigs wallowing in the mire. Grass, rice, and shells have been found in their stomachs, but Dr. Anderson has clearly shown that they are not vegetable feeders, for in the rainy season, when great tracts of land are under water, these animals pursue the fish right into the submerged "paddy-fields," and the grass is thus most probably swallowed with their prey. The Hindoos have religious superstitions concerning the Susu. It certainly is one of the oldest known Cetaceans, since Pliny and Ælian both allude to it. It has been supposed that the kind which inhabits the Indus was a separate species, but this error has doubtless arisen from the great difference in size of the skulls of the two sexes. This animal must be all but blind, the optic nerve being no thicker than a thread; but the fact of its living habitually in muddy water renders sight less necessary than it otherwise might be. Its peculiar dentition, so like that of the ancient Squalodons in many respects, is of exceeding interest. The following is the dental formula of one specimen, $\frac{27-28}{30-32}=117$. The broad roots of the rearmost teeth are usually grooved, and this gives them a deceptive appearance of possessing more than one fang; moreover, differing as the teeth do front and rearwards, still distinctions as to incisors, canines, and molars can hardly be said to exist.



GANGETIC DOLPHIN.



FLIPPER OF GANGETIC DOLPHIN.

THE INIA, OR AMAZON DOLPHIN,* is another of the remarkable fresh-water forms. The former name is that given to it by the Indian tribes of Bolivia. It ranges from the mouth of the river up the whole of its affluents of any magnitude, 2,000 miles from the sea. Mr. Bates, in his "Journey on the Amazon," tells us that when it rises the top of the head is the part first seen; it then blows and immediately afterwards dips head downwards, its back curving over, exposing successively the whole dorsal ridge with its fin. It seems thus to pitch heels over head, but does not show the tail fin. It generally goes in pairs. Exceedingly numerous throughout the Amazons, it is nowhere more plentiful than in the shoaly water at the mouth of the Tocantins, especially in the dry season. The Indians have a story that the "Bouto," as they also call this creature, "once had the habit of assuming the shape of a beautiful woman, with hair hanging loose to her heels, and walking ashore at nights in the streets of Ega, to entice the young men down to the water. If any one was so much smitten as to follow her to the water-side, she grasped her victim round the waist and plunged beneath the waves with a triumphant cry." It is held in veneration, and on this account the Indians can hardly be induced to harpoon it. They have a superstition that blindness results from the use of its oil (which nevertheless is excellent for lamps), and though Mr. Bates prevailed upon an Indian to capture one, the fellow repented of his deed the day afterwards, declaring that his luck had there and then forsaken him. This animal is seven or eight feet long. Its colour commonly is bluish above, passing into a pale flesh-colour beneath, the tail and flippers being bluish, but the tints vary considerably, and even differ with age and season. The head is furnished with a long beak. There is a kind of keel-shaped dorsal fin, and the flippers are of fair size, broadish and tapering, thus differing from those of the Susu. The skull has a certain resemblance to that of the Gangetic Dolphin, but without the great cheek-crests peculiar to the latter, besides other minor differences. In both jaws there is a long series of stout conical teeth of a pretty uniform size. These vary in number in different specimens, as the following formulæ in two separate individuals show $\frac{26-26}{25-27}=104$; $\frac{34-32}{33-32}=131$. The muzzle of the young is hairy; while both the eye and the ear-hole are much better marked than in the Susu. It is a fish-eater, and the mother exhibits great affection and devotedness towards her young.

THE PONTOPORIA.†—Like Inia this is a South American form, and is now known to inhabit the mouth of the La Plata and other rivers entering into the Atlantic on the coasts of the Argentine Republic and Patagonia. But, unlike the two preceding forms, it is not confined to the rivers, for it ranges along the sea-coast. The very few specimens met with show it to be a small animal, not more than four feet long, of a blackish tint, pale beneath, with a white streak along each side from behind the blow-hole. It has an unusually long narrow beak, but not such a prominent head as in the two others. This animal has a well-marked triangular dorsal fin, and the fore-flipper is somewhat fan-shaped and broadish, and not pointed as in the Inia. The crestless skull has characters intermediate between the river Dolphins and the marine Dolphins to be described farther on. The teeth are small and very numerous, somewhat fewer in the young animal, conical in shape, with a swollen ring round their base. The dental formula is as follows:—$\frac{53-53}{53-53}=212$; or $\frac{57-57}{54-54}=222$.

THE ZIPHIOID WHALES (ZIPHIIDÆ).

These singular Whales form a very compact group, closely united by common attributes, but they are readily separated by definite characters from others. Until the beginning of the present century, the Bottlehead (or Butzkopf) was that only known. Since then, at irregular intervals, chiefly solitary individuals have been caught or stranded in various parts of the world; but even now the numbers coming under observation have been few. Their apparent comparative rarity in the present day is in great contrast with the frequent discovery of their remains in the Norfolk Crag formations, where fragments, principally of their dense solid beaks, show that they must have been at a long distant period exceedingly numerous. On these grounds the supposition has been expressed that the present paucity of forms is indicative of a survival of an ancient family that once played an important part in Nature. The living forms range from fifteen to thirty feet in length, but their ocean habits are extremely obscure. Their common characters are long narrow beaks, elevated heads, a small but well-marked dorsal fin placed behind the middle of the back, short flippers with rounded extremity, a pair of short throat-furrows of a V-shape (point in front), a single somewhat crescentic blow-hole, placed crosswise in the middle of the head, absence or only rudiments of teeth in the upper jaws, and one or two pairs of very peculiar teeth, variable in size, in the lower jaws, along with certain other peculiarities of the skull. We shall refer but to a few of the group.

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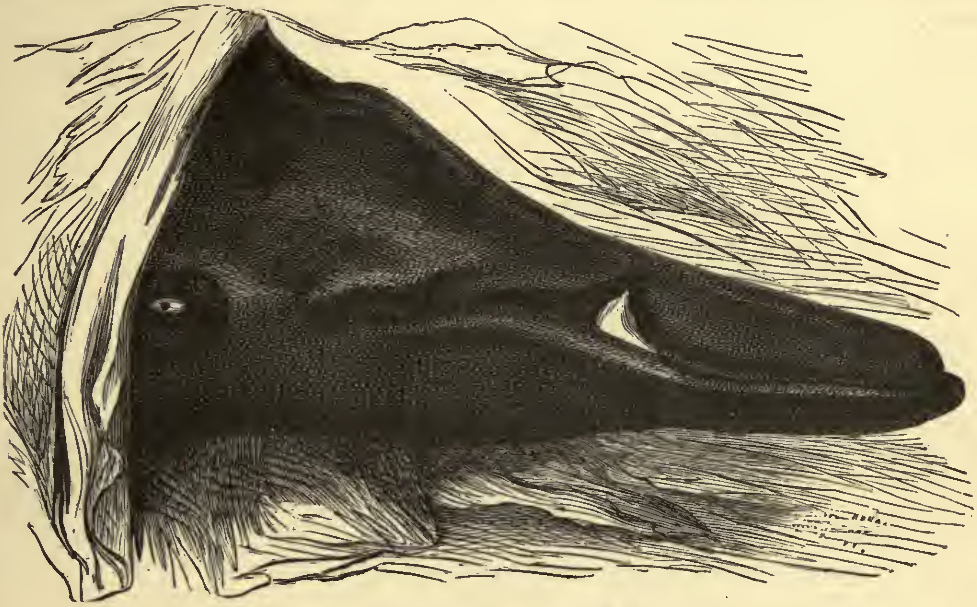
* *Inia Geoffrensis.*

† *Pontoporia Blainvillii.*

Of the genus *Ziphius* we may admit CUVIER'S WHALE* and VAN BENEDEN'S WHALE.† Their size appears to vary from sixteen to twenty-four feet, and their colour is said to be steel-grey, with irregular white body streaks, the abdomen also being whitish. The head is less prominent than in the Bottle-head, and the snout is a trifle shorter, with the lower jaw slightly upturned, fuller than the upper, and furnished with two teeth at the tip. The flippers are short and somewhat pointed, and the dorsal fin is situated well behind, and not very large. There is a deep hollow at the base of the rostrum or beak, over which the skull rises crest-like from behind forwards. The genus *Ziphius* was originally based on a supposed fossil skull from near the mouth of the Rhone; living species, however, have been since recorded, and of one from South America Burmeister gives a detailed notice under the name of *Epiodon australis;* still it is doubtful whether this is not one of the two above-mentioned animals.



HEAD OF MESOPLODON. (*After Andrews.*)

SOWERBY'S WHALE ‡ is representative of the genus *Mesoplodon.* This animal is black above, white below, and the sides marked with wriggly white streaks. The small dorsal fin is situated well back, the flippers are small and narrow, the head is rather low, sloping towards the beak, and the upper jaw is shorter than the under. It also has two teeth in the lower, and none in the upper jaw. Thus externally it bears strong resemblance to Cuvier's Whale, but it differs in the slender beak, without a hollow at its base. Sowerby's Whale is interesting from having been first obtained in 1800 off the Elgin Coast, and described by Mr. Sowerby as the Two-toothed Cachalot (*Physeter bidens*). The genus Mesoplodon has since given rise to considerable discussion, various names being assigned to it. Professor Flower points out that of the various Ziphioid Whales obtained on British coasts, France, the Cape, and New Zealand, described as different genera, &c., he recognises seven species of *Mesoplodon,* Sowerby's Whale being the type, and the others differing chiefly in the form of the teeth. Another of this curious family is the NEW ZEALAND BERARDIUS,§ of which some four specimens only are known to science. Dr. Julius Haast records the capture of one near Canterbury, New Zealand, in 1868, which animal was 30½ feet long, velvety black, with greyish belly. One of the observers who saw the creature alive stated that it protruded its teeth—a remarkable fact if true. In its stomach were found half a bushel of the horny beaks of a species of Octopus. Professor Flower has described its skeleton, and affirms that it is truly ziphioid in character, but on the whole approaches nearer to the true Dolphins; whereas the Bottlehead is modified in the direction of the Sperm Whales. THE BOTTLEHEAD, OR COMMON BEAKED WHALE,* is a constant visitor to the coasts of Britain, many instances having been recorded of its capture, and one classical example came under the scalpel of the celebrated anatomist John Hunter. It inhabits the breadth of the North Atlantic, and according to Eschricht very probably spends the summer far north in the Polar Sea, and migrates southwards towards autumn or winter. Dr. R. Brown regards it as rare in the Greenland Seas, three or four, however, being occasionally seen at the mouth of Davis Strait. On the French and Scandinavian coasts small herds have sometimes run ashore. The female gives birth to a single young one in autumn. They feed chiefly on cuttle-fish, but also upon soft-bodied Trepangs (*Holothuria*). It ranges from twenty to forty feet in length, according to age and sex, and is of a uniform blackish hue, lighter beneath, but not white. The skull is most peculiar in having two crests at the occiput, of most unequal size and figure, and the cheek-bones at the root of the beak raised into a pair of huge elevations. The upper jaw is toothless, and the lower jaw has only two or three small concealed teeth. The neck vertebræ are united; and moreover the stomach is remarkable even among Cetacea for the number of chambers it contains, there being some six or seven divisions.

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* *Z. cavirostris.* † *Z. indicus.* ‡ *M. Sowerbiensis.* § *Berardius Arnouxi.*

THE SPERM WHALES, OR CACHALOTS (PHYSETERIDÆ).

This family includes but two forms: the valuable Sperm Whale (*Physeter*) and the Short-headed Whale (*Kogia*). They are unlike in many respects, but they agree in having no teeth, or only rudimentary ones in the upper jaw, while the lower jaw is provided with a series of conical teeth. The dorsal fin is small, either hump-like or high and falcate; the flippers are very short, and situated along with the small eye near the angle of the great mouth. The neck vertebræ are fused together. The upper surface of the broad shoe-shaped skull has a large basin-like cavity, wherein in the soft parts the material known as spermaceti is lodged. The blow-hole is single, and in the case of the Sperm Whale is situated quite in front, but is placed farther back in the Kogia. In both, however, it is somewhat of an *f*-shape obliquely placed, the left extremity being much wider than the right.

TOOTH OF THE SPERM WHALE.

THE SPERM WHALE, OR CACHALOT.†—Next to the Greenland Whale the Cachalot is by far the most important animal of the Whale tribe in a commercial point of view. A rare interest, moreover, is attached to it from the daring deeds and hair-breadth escapes of the whalers pursuing it, inasmuch as in certain cases it is among the fiercest of the Cetacea. At times it not only attacks boats and their crews in pursuit of it, but there are also well-authenticated instances of ships themselves being assailed and sunk by this powerful monster of the deep. It attains a size varying from forty to seventy feet, the average of old males being about sixty feet, while the females are much smaller. It is black above, lighter on the sides, and silvery-grey on the belly parts. Its head is of enormous proportions, forming nearly half the bulk of the animal. The snout is extraordinarily dilated and terminates abruptly; the upper jaw quite overhangs the lower, and the bones of the latter are united close together for a long distance, and are furnished with from twenty to thirty teeth on each side. As shown in the woodcut, each tooth is conical and slightly curved, hollow at the base, but elsewhere it is dense and solid. When the lower jaw is closed the teeth fit into hollows in the upper lips, in this respect somewhat resembling what takes place in the Crocodile's mouth; but besides the remarkable lower jaw, the Sperm Whale's skull rivets attention from the extensive basin-shaped spermaceti reservoir already alluded to. The throat is very large as compared with that of the Greenland Whale. It was believed that there were several species of Cachalot, but only one is now acknowledged, the Kogia really belonging to a different genus. The Sperm Whale is seldom found in inland waters, but is met with in all the oceans, from the Polar to the Antarctic, though it chiefly inhabits the tropical or sub-tropical seas. Among the favourite resorts of the whalers are the coasts of New Guinea and adjacent parts, Australia, New Zealand, and several of the Polynesian islands, the coasts of Peru, Chili, and California, the Japanese and Chinese waters, the Molucca group, and the mouth of the Persian Gulf. Its appearance in the Atlantic has of late years been irregular and seldom, though at one time it was of tolerably frequent occurrence in the South Atlantic and American coasts, and near the Bahamas. Its steady pursuit for a long series of years has greatly thinned its numbers. About 1770 the Americans, and a few years later the British, in small ships of 100 tons and over, established the Sperm Whale Fishery with very moderate success. Before 1780 the British Government issued bounties to encourage the trade, and this led to the sending out of larger vessels, while Mr. Enderby, a London merchant, pushed the fishery into the far-distant shores of the Pacific.

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* *Hyperoodon rostratus.*

† *Physeter macrocephalus.*

SPERM WHALE.

The vessels, of much larger tonnage and better manned, were absent for two or three years, and the scenes of the chase, they say, at times almost defied description. Surgeon Beale's incident, though tolerably well known, is worth notice. On the coast of Japan, in 1832, some three boats pursued a Whale all day long. By a dexterous move the animal was at last lanced, when it spouted blood, suddenly descended about forty fathoms, and as quickly rose and dashed the boat into the air in fragments. The men clung to the oars and broken wood, and, in spite of the vicinity of Sharks and the Whale itself, were saved by the other boats, the crews of which avenged themselves by ultimately killing the Whale. Of fighting Whales there are numbers of stories, that of one old male, familiarly known as "New Zealand Tom," being still traditionally recounted in the forecastle. In 1804 the *Adonis* and several other ships simultaneously attacked the fellow, who destroyed some nine boats before breakfast, but in the end was captured, when a host of harpoons were found in its body. There can be no doubt that the Sperm Whale is a migratory animal, though its migrations are by no means clearly understood. It is a gregarious creature, "schools" of a dozen to fifty or sixty being occasionally met with. At other times great fellows are found here and there on lonely pilgrimages, while still at other times a few together will be seen *en route* to fresh feeding-grounds. Adult females, or those with young in their company, evince a strong affection for each other, and when one is killed or sustains injury, parents or companions hover about and even render assistance. The whalers take advantage of this trait, and often kill a number ere the others make off. When, however, a company of young male Whales are found, and one is attacked, little love or interest in each other's welfare is manifested, every one rushing off helter-skelter in all directions, to the whalers' chagrin. The old "bulls," on the other hand, are more sedate and less easily frightened, and unless roused by injury to retaliate on their pursuers are more readily harpooned. The Sperm Whale is easily known from all others, even at a great distance, from the regularity of its blowing and the manner in which it throws up a volume of vapour obliquely forwards. It traverses the ocean surface in a steady methodical manner, at the rate of four or five miles an hour, its great head or hump-like back occasionally appearing above water. It will remain on the surface from ten to fifteen minutes, and then will descend, staying below an hour or more, but the females and young remain up and descend at more frequent intervals. At times, instead of quietly swimming on the surface, they proceed more quickly by a kind of lounging motion, the head being thrust well out of the water, a mass of spray, technically called "white water," accompanying this mode of progression. Occasionally they spring headlong out of the sea ("breaching"), or violently beat the surface with their tails ("lobtailing"), or at other times dash about in a variety of attitudes. Sometimes they move their fins as if feeling around for enemies, or throw their bodies awry, bringing the mouth well to the surface. It is pretty certain that Cuttle-fish form a large proportion of their food, though there is reason to believe that they do not despise fish and other marine creatures. It is still a moot point how they feed, and to what use they put their teeth. Some assert that in the depths the under jaw is lowered, and the glistening pearly teeth fully shown; attracted by the latter, its prey approach and the trap is closed. Blindness at times supervenes. Still more curious are instances where the lower jaw is twisted like a shepherd's crook, and strange to say, notwithstanding this deformity, these Whales seem fat and hearty—this fact giving rise to much speculation whether such malformation has arisen from fighting and distortion of the jaw in youth, or from other causes not yet ascertained. The Sperm Whale has its enemies, the Thresher Shark leaping on it and attacking it from above, while the daring Killer Whale (*Orca*) assaults it from below. The female, it is said, breeds at all seasons, producing one, but occasionally two, at a time.

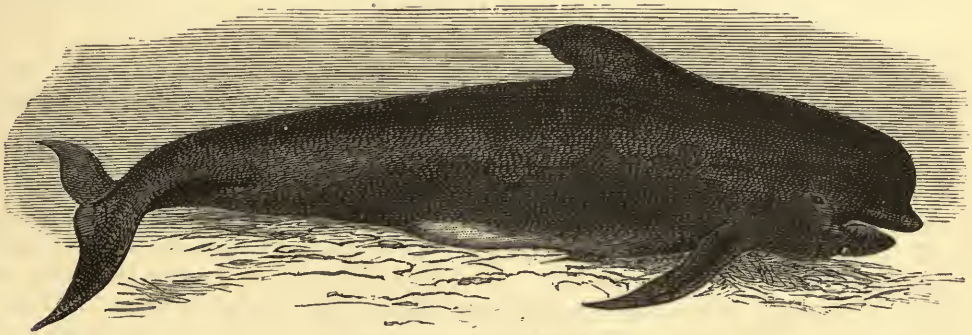
The double-bowed whale-boats are manned by six men, and when they approach the Whale one steers aft with an oar while the harpooner plies his craft. As soon as it is struck the rowers "back" away. Meanwhile the creature dives, carrying harpoon and line, or rolls rapidly round coiling the rope on its body. The other boats approach, and as it rises harpoons and lances are dexterously used, and as the blood escapes in volumes, despite its vast efforts the creature succumbs. Immediately after its death the boats are made fast to the carcass, and the ship reached as circumstances best permit. Secured alongside, a man descends, cuts a hole behind the head, inserts a hook, often under most dangerous conditions, especially if the sea is rough. The fat or blubber is cut by sharp spades in a long spiral strip, and pulleys applied, and these skin and blubber strips, termed the "blanket pieces," are thereupon hove on deck. The carcass afterwards is rolled round and the opposite side similarly treated. The great head meantime is cut off, and floated astern until the trunk is deprived of its blubber. The head is then opened from above, and among the coarse fat and blubber of the forehead—the so-called "case"—is a fluid oily matter, the spermaceti. This substance is handed up in bucketfuls, and preserved in casks. On its removal the wedge-shaped oily and fibrous head-piece, the "junk," is next secured; head and trunk are then sent adrift. Then follows the "trying out," that is, boiling the fatty masses and extracting the oil, which operation is done in furnaces, the scraps of fat mainly serving as fuel. Finally, the oil and head matter are casked up, and a fresh lookout from the masthead is kept for more Whales. The crow's nest is a large barrel on the cross-trees, where a watcher is stationed during the whole voyage. No sooner is a Whale spied than the shout, "There she blows!" or, as the Americans have it, "There she spouts!" is replied to from the deck by a hurried rush to the boats, for each seaman's kit and provisions are beforehand ready prepared in a bundle, and before a few minutes have passed, the hardy mariners are on their way towards their gigantic spoil. Sperm oil, we need hardly say, is exceedingly valuable. The quantity obtained between 1835 and 1872 by the Americans alone is reckoned at 3,671,772 barrels, and the wholesale price has varied during these years from four to ten shillings per gallon.

THE SHORT-HEADED WHALE, OR SNUB-NOSED CACHALOT.*—Under this name, and possibly also that of Gray's Kogia,† an animal has been described which, far smaller in size and in many respects differing from the Sperm Whale, nevertheless is more closely allied to it than to any other of the Cetacea. Whether the two names belong to different or the same species may be left open for the present. At all events, specimens have been obtained at the Cape of Good Hope, the East Indies, and Australia, which so closely resemble each other as probably to belong to one and the same species. This animal measures from six to ten feet in length, and is almost Porpoise-like in general appearance. It has a well-marked dorsal fin behind the middle of the body, short flippers, and the snout is said to be turned up with a margin somewhat like a Pig's. The upper surface of the body is black, and the under parts have a tinge of yellow or light flesh-colour. The few specimens hitherto obtained afford no information regarding its habits. The peculiar construction of its skull, short, broad, distorted, with a bony division in the spermaceti cavity and other skeletal characters, give it an interest as being an intermediate form between the Cachalot and the Dolphins proper.

THE DOLPHINS (DELPHINIDÆ).

This group possesses considerable diversity in outward form, in skeletal characters, and dentition; nay more, many of the genera blend into each other. The Narwhal by its peculiar teeth, and the White Whale by its colour, besides some few other points, stand apart. The Porpoise and the Neomeris agree in teeth and skull; the Killer Whales are distinguished by their broad flippers; the Pilot Whales, on the contrary, by the extreme length and narrowness of their flippers; the Dolphins proper have long narrow beaks and numerous teeth; while several other genera unite characters so that it is difficult to define where one commences and another ends. Nearly all have dorsal fins. Excepting in the Narwhal, numerous teeth exist in both jaws. The lower jaws are united only for a short distance, and there is no distinct skull crest behind the nasal orifice, while the neck vertebræ in most are soldered together. The difficulty in giving the natural sequence, the genera, and species of this group, for reasons aforesaid, leads us to commence with one which has a singular prominence in the forehead, composed of a soft blubbery material intermingled with strong fibres, one might say, a kind of modified spermaceti substance.

THE CAAING, OR PILOT WHALE, OR DEDUCTOR,‡ is one of the best known Whales that frequent the British coasts, herds of hundreds having often been run ashore in the Shetlands, Orkneys, and even in the Frith of Forth. Adults average from sixteen to twenty-five feet in length, are of a jet-black colour, but lighter or whitish on the abdomen. The body is cylindrical, tapering to the tail; the dorsal fin is high, placed at the middle of the back; the flippers are unusually long and narrow, and the fingers possess an unusually great number of bones, as many as fourteen to the second digit. The head is quite



CAAING, OR PILOT WHALE.

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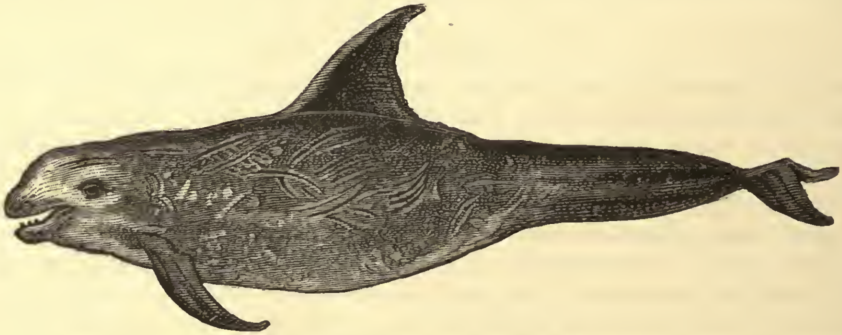
* *Kogia breviceps;* the *Physeter simus* of Owen. † *K.* (*Euphysetes*) *Grayii* of MacLeay. ‡ *Globiocephalus melas.*

characteristic, having the form of a massive boss. The teeth are somewhat numerous, namely, $\frac{24-24}{24-24} = 96$. When these Whales are seen gambolling in the bays of the Scottish shores, the hardy fishermen start in their boats and form a cordon seawards. Then by gunshots, shouts, splashings, and throwing stones they drive them towards the shore; and as the animals madly plunge to shallower water, pressing through fear one over the other, the men dash into the water and begin havoc with harpoons, scythes, spears, picks, or spades—indeed, whatever weapon comes handiest. Thus numbers, from even fifty to as many as two hundred, fall an easy prey. Such an encounter took place in 1867 near Prestonpans on the Frith of Forth, when one Whale wounded by harpoons struck seawards, hauling a boat and crew of twelve men nearly as far as Inchkeith ere it succumbed. There may be more than one species of this Whale, widely distributed, but whether or not, their habits and general appearance have much in common.

A rather remarkable form is RISSO'S GRAMPUS,* inasmuch as its colouring and marking are so variable, and in some cases so characteristic; indeed, no two specimens yet obtained can be said to be alike. The head is fuller and rounder than that of the Porpoise, and its flippers longer and narrower—in these respects approaching the Pilot Whale. The prevailing tint is grey, darker above, and under parts paler, and in some there are a few indistinct and irregular lighter-coloured bandings. In other examples, notably one obtained by M. Risso in the Mediterranean, and by Professor Flower on the British coast, the side of the body and even top of the head exhibited a mass of intercrossing, wavy, scratched lines and spots of white and grey, following no special pattern. It has been found both on the French and English coasts in spring and summer, but is suspected to be migratory, visiting Europe in summer, and proceeding to the African or possibly the American continent towards winter. The variation in colour has given rise to different specific names. Somewhat intermediate between the foregoing and the Porpoises, are certain forms found on the Indian coasts and even the Irrawaddy River; the genus *Orcella*, for example, combining the head of the Pilot Whale with the body and flippers of the Porpoise.



RISSO'S GRAMPUS. (*After Flower.*)

THE COMMON PORPOISE,† the *marsouin* of the French or *meerschwein* of the Germans, is the most familiar Cetacean of the British and adjoining coasts. Their average length is four or five feet, though often more. The colour slightly varies with age and sex, more usually a polished bluish-black tint on the upper parts, merging into a pink or mottled grey or whitish below. The dorsal fin and flippers are both of moderate dimensions. Their head is roundish, and not so blunt or bomb-like as in the *Globiceps*, nor so sharp-nosed as in the true Dolphin tribe. Its diminutive eye, no visible ear, tapering body, and broad tail are all markedly Cetacean in character, so that, though small, it gives a very good idea of the Whale tribe generally. The semilunar transverse blow-hole as it rises to the surface slightly opens, but in a tank no lofty jet of vapour is thrown up as is the case with the large Whales at sea. In looking into the pink-coloured mouth one sees above and below a row of small equal-sized simple teeth, and a flat tongue which is not protrusible. The dental formula is $\frac{20-20}{20-20}=80$, or $\frac{26-26}{26-26}=104$. In structural detail, both internally and in the skeleton, it is a fair type of the group Delphinidæ. Porpoises either of the common sort or species barely to be distinguished from it have a tolerably wide distribution, being found all over the Mediterranean, Pacific, Atlantic, and Arctic regions. They evidently migrate, as they appear in Davis Strait in the spring, and stop there till November. They are true fish-feeders, and herd in enormous numbers. A prettier sight can scarcely be conceived than a large shoal frolicking, dashing, and springing in all manner of fantastic curves with an amazing rapidity. Woe betide the "schools" of Herrings, Mackerels, and Pilchards that are followed by these rapacious creatures, which cause great havoc among them! They give birth to their young about May. Mr. H. Lee, on Mr. Scott Siddons' authority, relates that in the surveying voyage of the *Herald* the natives of Moreton Bay entreated the seamen "not to shoot their tame Porpoises." These crowded lazily near the shore, and when a shoal of fish entered the bay the people roused the Porpoises, which dashed among the fish, ate some, and drove the rest ashore. Porpoise flesh, though no longer an article of diet, was once held in high estimation, and even graced the royal table as late as the time of "bluff King Hal." Porpoise meat was generally eaten with a kind of mint sauce, and porpoise pudding was not an unusual dish during Lent as coming under the denomination of supposed fish. "Porpoise leather" now in vogue is in reality the skin of the White Whale.

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* *Grampus griseus.*

† *Phocœna communis.*

SHOAL OF PORPOISES.

THE KILLER WHALE, OR ORCA,* is truly the terror of the ocean. Not only Porpoises, White Whales, and Seals spring out of the water and run ashore in fear of it, but the great Sperm Whale and the Greenland Whale stand in deadly awe of its attack. It ranges in size from eighteen to thirty feet long, and its fierceness and voracity are unbounded, as is well shown in an example which came under Eschricht's observation. From the stomach of this individual he took thirteen Porpoises and fourteen Seals, and the atrocious glutton had been choked in the attempt to swallow a fifteenth! Hollböll saw a herd of White Whales driven into a bay in Greenland where they were literally torn to pieces by these voracious Sea-wolves. Scammon says that three or four do not hesitate to grapple with the largest Baleen Whales; the latter, often paralysed through fear, lie helpless and at their mercy. The Killers, like a pack of hounds, cluster about the animal's head, "breach" over it, seize it by the lips, and haul the bleeding monster under water; and should the victim open its mouth they eat its tongue. In one instance he relates that a Californian Grey Whale and her young were assaulted; the Orcas killed the latter, and sprang on the mother, tearing away large pieces of flesh which they greedily devoured. These brutes have been known to attack a white-painted herring-boat, mistaking it for a Beluga; and it is stated that occasionally they will boldly lay siege to Whales killed by the whalers, almost dragging them perforce under water. Near some of the Pacific sealing-grounds they continually swim about and swoop off the unwary young; even the large male Sea Lions hastily retreat ashore and give these monsters a wide berth. The Walrus also, with his powerful tusks, cannot keep the Killers at bay, especially if young Morses are in the herd. The cubs on such occasions will mount upon their mother's back for refuge, clinging for dear life; but the Orca, diving, comes suddenly up with a spiteful thud, and the cub losing its balance falls in the water, when in an instant it is seized by the remorseless Whales. These latter do not restrict themselves in diet solely to their own or the Seal tribe; for Scammon asserts that they even make marauding expeditions up strong-flowing rivers

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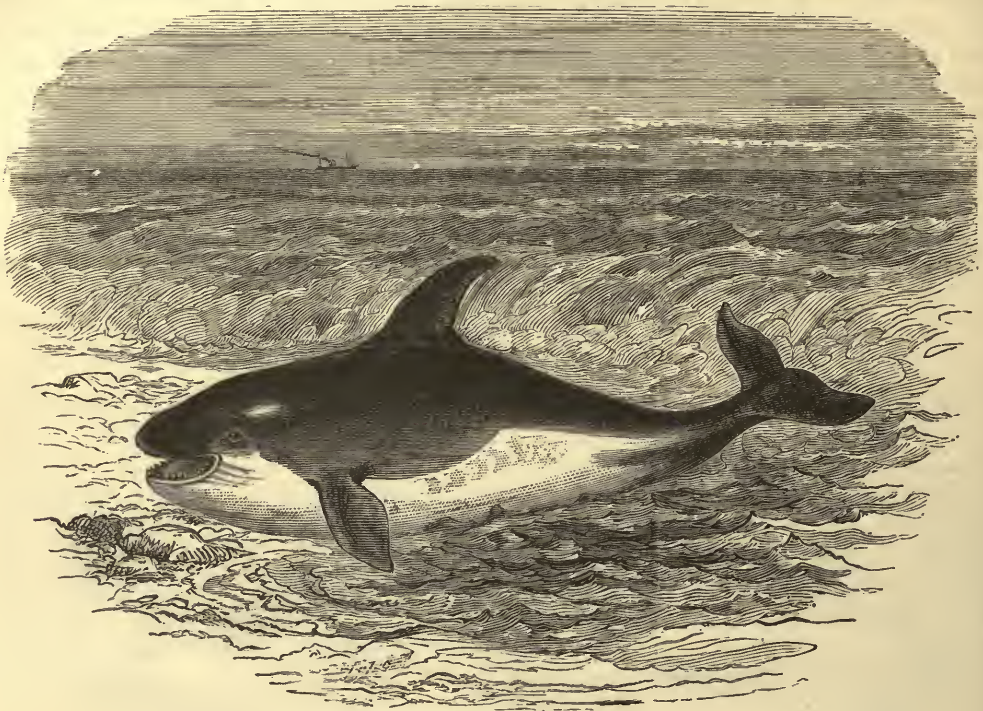
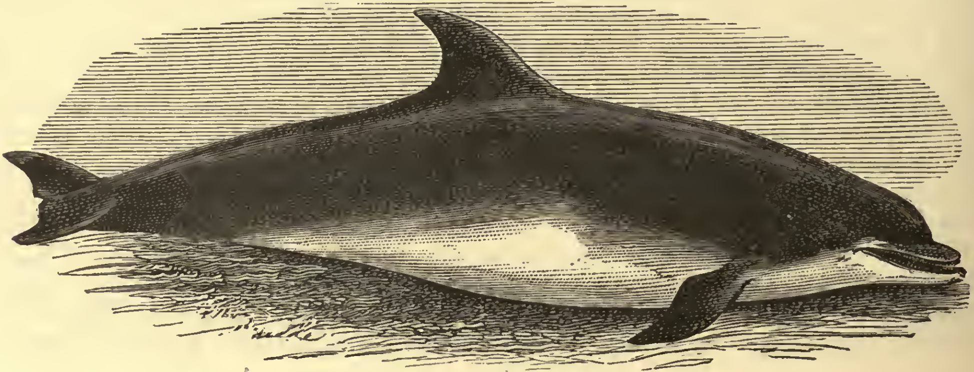
* *Orca gladiator.*



KILLER WHALE, OR ORCA.



BOTTLE-NOSE DOLPHIN. (*After Flower.*)

in pursuit of the Salmon and other fishes, a statement corroborated by observers on British coasts. The great swiftness of these creatures is best realised by the fact that they pursue and overtake the quick-swimming Dolphins, literally swallowing them alive. They are not gregarious in the sense of being found in large herds, but follow their prey in small squads. At times they move rapidly near the surface, their great back-fins projecting, or they tumble and roll about, even leaping out of the water and cutting all manner of capers. They have an evenly-rounded head, blunter than the Porpoise's, the upper jaw a trifle longer than the lower. Their flippers are broad and oval-shaped, and what renders them peculiar and easily recognised is their greatly-lengthened dorsal fin, in some species said to be equal to one-fifth of the whole length of the animal. Though slightly varying in colour, they are usually glossy black above, and white below, the tints sharply defined. Above the eye is a white patch, and occasionally there is a greyish saddle mark on their back. Their capacious mouth is provided with eleven or twelve teeth on each side above and below, and each tooth is most powerful, conical, and slightly recurved.

DOLPHINS PURSUING A BOAT.

THE TRUE DOLPHINS, from which in fact the group *Delphinidæ* takes its origin, are associated in mythology and poetry to a considerable extent. The car of Amphitrite drawn by these oceanic animals is well known. The COMMON DOLPHIN * and the BOTTLE-NOSE DOLPHIN † of British coasts are kinds familiar to fishermen and sailors, the former evidently being that known to the ancients. Naturalists have recognised many genera and numerous species of the Dolphin tribe, but into these and their distinctions we shall not enter. If we take the common Dolphin as a representative, it will be seen that the head has a well-marked rostrum or beak, and an abruptly-rounded forehead; the dorsal fin is high, and the flippers of moderate size. When adult they average from six to eight feet in length. Their colour is black above and brilliant white beneath; though many of the species of Dolphins are parti-coloured, white predominating. The teeth vary in number from forty to fifty on each side, above and below—that is, from 160 to 200 in all. They feed on fish, medusæ, and crustaceans; and they congregate in great herds, never being seen alone. This species inhabits the North Sea, the Atlantic, and the Mediterranean; but the different genera and species of the Dolphins have a wide range over the seas of the warmer and of the temperate zones; some even ascending rivers after their prey. As a group their habits are considerably alike, and they are all excessively playful and active, and seem to delight in gambolling around vessels,

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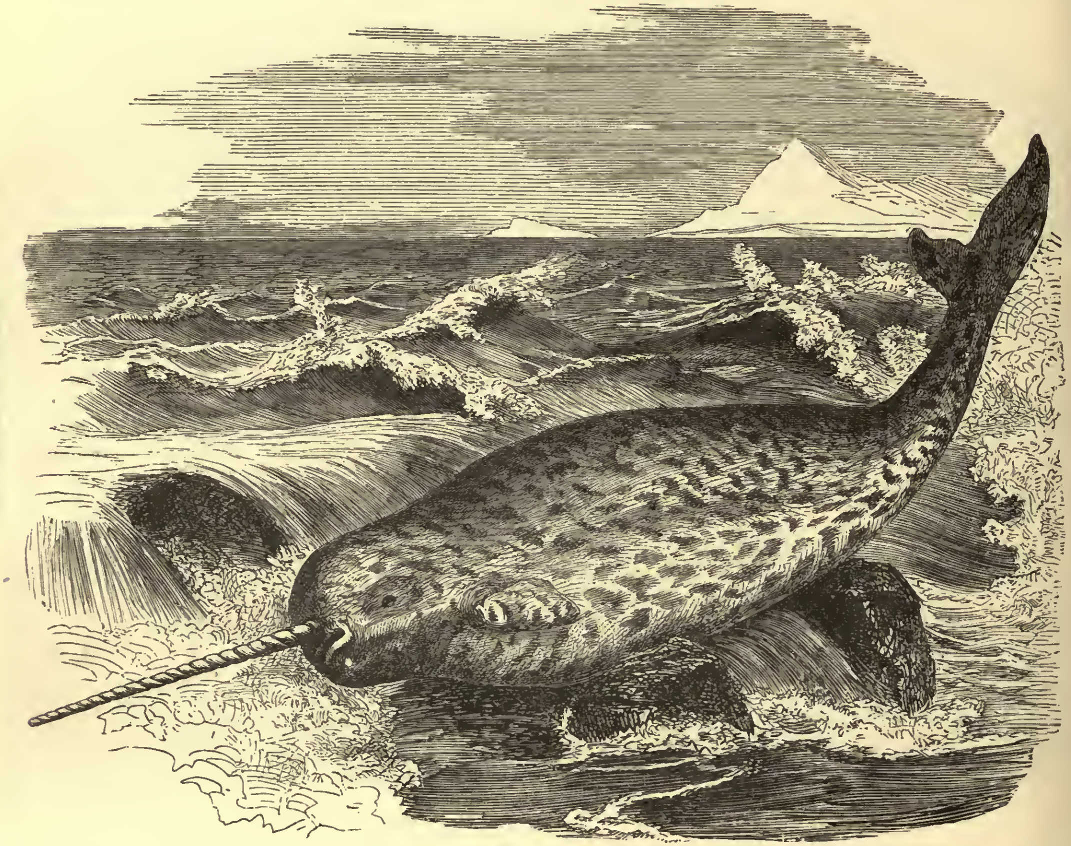
* *Delphinus delphis.* † *D. tursio.*

"Or dive below, or on the surface leap,
And spout the waves, and wanton in the deep."

The White Whale, or Beluga.*—In September, 1877, a White Whale nine feet and a half long, which had been captured on the coast of Labrador, arrived at the Westminster Aquarium. Though not of the largest size—for they attain a length of even sixteen feet—this example nevertheless was characteristic. Symmetrical in form, creamy white in colour, without dorsal fin, with short stumpy flippers, and a bulging-rounded forehead, there could be no mistaking the species. Unfortunately it lived but a few days, though Mr. Barnum was more fortunate in keeping these creatures alive in a tank in his museum at New York. The dental formula of the Beluga is $\frac{8-8}{8-8} = 32$; or $\frac{10-10}{10-10} = 40$; the small conical teeth are implanted only in the front of the jaws, and frequently drop out early in life. It is abundant over a wide area of the northern regions, and is very partial to ascending rivers after fish, for a long distance. Dall records one taken 700 miles up the Yukon river, and Nordmann mentions that it ascends the river Amoor. It is well known in the St. Lawrence and Labrador coasts, as also in the White Sea, where there is a regular White Whale fishery; but withal it is truly a Greenland Cetacean, being found there all the year round. Like the Narwhal it is very gregarious,



NARWHAL.

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* *Beluga leucas.*

sportive, and migrates in numbers, both sexes associating in the droves. It is fearless and inquisitive, approaching the ship with an easy roll, occasionally emitting a whistling sound; hence seamen call them "sea canaries." The female gives birth to a young one in the spring months, and this is of a bluish-grey colour, paling with age. Their docility and indeed intelligence, when captured, are well illustrated by one in America, which was trained to draw a car round the tank. It recognised its keeper, and allowed itself to be freely handled. It would play with a Sturgeon and a small Shark as a Cat would with a Mouse, but without injuring them; at other moments it would splash about and toss stones with its mouth. The Greenlanders dry their flesh for winter use, hoard their oil, and capture them by nets at the entrance of the fjords and inlets whenever chance permits. Five hundred or more every year are thus obtained. Dr. Rae says that the Beluga is similarly caught by nets in the St. Lawrence. The Indians also paint their canoes white and sail promiscuously among them, harpooning betimes. Every part of the animal is valuable to the natives of the north, the skin being manufactured into capital leather. A white Porpoise-looking Whale visits Amoy and other southerly harbours of China, but it is a true Dolphin (*D. sinensis*), and not a Beluga.

THE NARWHAL, OR SEA-UNICORN.*—Of all Whales this is the most unique on account of its so-called horn, or rather tusk, or, still better, enormously-developed canine tooth. Most museums contain examples of this extraordinary object, which seems like a solid rod of ivory, tapers from root to tip, has a kind of striated spiral surface, and is often from five to seven feet or more in length, thus being the longest tooth in the Mammalia. The adult animals vary from ten to sixteen feet long, and, like the Beluga, have a blunt short head, no dorsal fin, and very small flippers. It is essentially a northern form, inasmuch as it frequents the coasts of Greenland, Spitzbergen, and Siberia, though occasionally met with off Scandinavia and Britain, its favourite haunts, however, being 70° to 80° N. lat. It travels in great herds, and Dr. R. Brown avers that he saw thousands in their summer migrations following tusk to tusk and tail to tail like a regiment of cavalry, and swimming with perfect, regular, undulating movements. These herds are of both sexes. The Narwhals have grey backs, mottled with black, the sides and belly paling downwards to white, and equally spotted with grey or darker tint. The females are more spotted than the males, the young are darker, but some animals are much paler than others. The crescentic blowhole externally is single. Occasionally they utter a gurgling noise. In the stomachs of captured Narwhals, fish-bones, Crustaceans, Molluscs, and Cuttle-fish remains have been found. They swim with great velocity, and are most active creatures. They dash and sport about apparently with much glee, and Scoresby says that in their playful moments they parry horns as if fencing. He suggests that the horn may be used for spearing fish, as he found a large flat Skate in the stomach of one. Others imagine that it may be for stirring up food from the bottom; but it has been very deftly remarked that the female would thus fare badly, seeing she is destitute of the tooth in question. Fabricius' view, that it was to keep the ice-holes open during the winter, has a touch of truth in it, inasmuch as one among other instances has been recorded where it usefully supplied such a purpose. Dr. R. Brown mentions that in 1860 a Greenlander observed in a hole in the ice hundreds of Narwhals and White Whales protruding their heads to breathe. It was likened to an Arctic Black Hole of Calcutta, so eager were the creatures pushing towards it. The natives gathered around, harpooned and shot the creatures by the dozen, though many were lost, such was the

NARWHAL WITH THE TWO TUSKS DEVELOPED.

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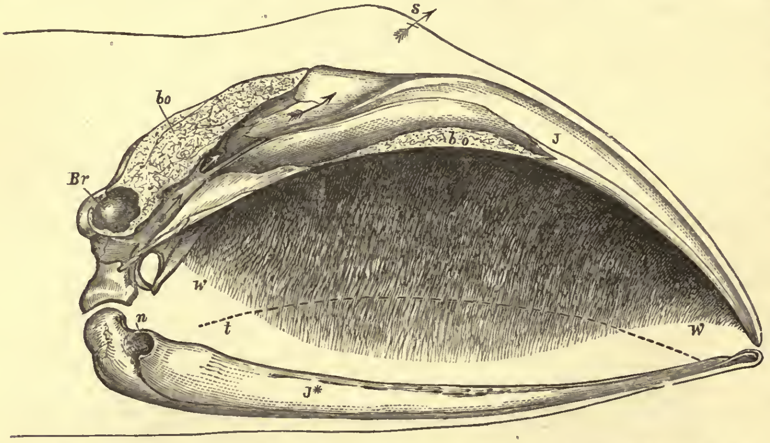
* *Monodon monoceros.*

scramble. The Narwhal possesses only two teeth: the greatly-developed or left canine, and within the jaw on the right side the rudiment of a similar tooth which seldom is protruded; although in certain rare cases, instead of one, the two tusks are developed. Along the jaw or gum there is a scolloped appearance foreshadowing as it were teeth. In the palace of Rosenberg, Dr. R. Brown states, there is a throne manufactured of Narwhal ivory, and Captain Scoresby had a bedstead made of the same substance. A Greenlander's dainty is Narwhal skin boiled to a jelly, this dish of *mattak* being a *bonne bouche* offered to strangers. The oil is very superior, the flesh extremely palatable. Though so peculiar in appearance and dentition, this veritable unicorn in all other structural peculiarities is truly a Dolphin.

THE WHALEBONE WHALES (MYSTICETE).



MEDIAN SECTION SHOWING INSIDE LEFT HALF OF SKULL OF WHALEBONE WHALE, WITH BALEEN IN POSITION. (*Modified after Eschricht.*)

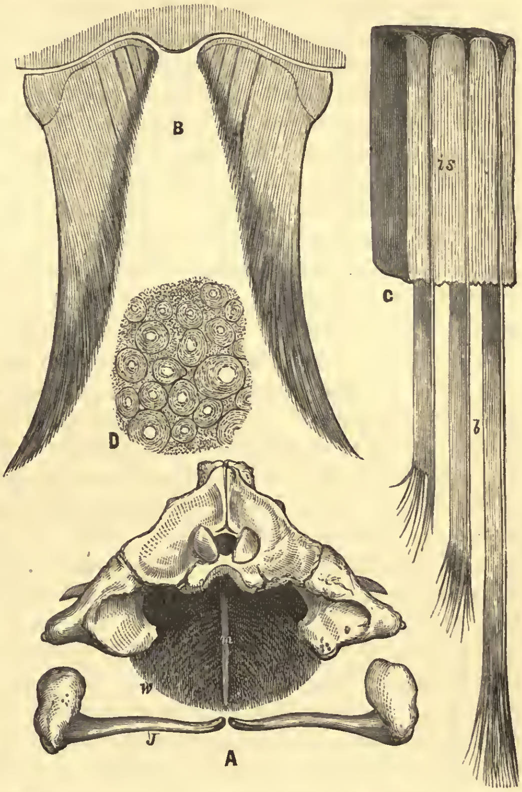
Br, brain cavity; *J*, *J**, upper and lower jaw-bones, *bo*, *bo*, being roughened parts of bone sawn through; arrows indicate narial passages, which open at *s*, spout-hole; *w*, whalebone; *t*, tongue in dotted outline; *n*, nerve aperture lower jaw.

These are distinguished from the Toothed Whales by their great upper jaws being provided with baleen plates instead of teeth; in early life, however, rudimentary teeth occasionally are present, but these never project beyond the gums. Their skulls are symmetrical and not distorted as in the Denticete. The organ of smell is distinctly developed, and there is a double aperture to the blowhole. The separate bones in the lower jaw arch widely outwards. The upper jaws are relatively narrow and project forward at the same time with a great fore and aft arch, but are encompassed by the lower jaw arches. The head is proportionally of immense size, and admits of an extraordinarily capacious mouth. The palate is but a narrow median line, and the huge mouth little else than an enormous dome of whalebone plates whose inner lower margins are frayed. Thus while the whalebone is longer than the depth of the closed mouth, it nevertheless is accommodated by being tucked in below at its flexible extremities. A great broad massive tongue fills the interspace between the lower jaws. From this peculiar mouth-formation, the bony area of and around the brain-pan is relatively small.

Most people have seen a large plate of whalebone, dark-tinted or occasionally lighter, and one extremity ending in a fringe of bristle-like hairs. The whalebone blade of dense horny-like material is in the early stage composed of a brush of hair-like bodies, which, lengthening, solidify and assume the hard horny appearance afterwards known in the blade. The gum of the upper jaws has a series of these plates, the one in front of the other, which elongate as growth proceeds, but leave the free extremity with a fringe of separate hairs. Again, the blade towards the gum is embedded in a fleshy substance similar to the roots of our finger-nails. It grows continuously from the roots, like the latter, and in many respects corresponds, save that the free end is always fringed. Baleen, therefore, though varying from a few inches to a number of feet long, in fact approximates to a series of so to say mouth nail-plates, which laminæ have a somewhat transverse position to the cavity of the mouth, and thus their inner split edges and lower free ends cause the mouth to appear as a great hairy archway, shallower in front and deeper behind. The animal in opening its mouth gulps a quantity of water containing its minute marine food, and then closing the mouth the liquid escapes and the small mollusca, &c., are entangled in the hairy meshes. Some of the Whalebone Whales are distinguished as smooth-skinned and as wanting dorsal fins—the family Balænidæ, or Right Whales.

Others have either a hump-like protuberance or dorsal fin or a series of longitudinal skin-plaits on the throat—the Balænopteridæ, or Humpbacks, and Rorquals.

THE GREENLAND, OR RIGHT WHALE.*—Among the Cetacea this, *par excellence*, may be denominated *the* Whale, for much of the popular knowledge, interest, and commercial value of the group has centred in this animal. It is the well-known form followed by the Greenland whalers into the Arctic seas. The stories of its hunting and authenticated accounts of its vast size, &c., associate it in many minds as the most typical of the Whale tribe. But the truth is, it is unusual in many respects, and not even quite representative of the group of Whalebone Whales as a whole. Moreover, it is as well at first to take notice of the fact that of the genus *Balæna*, that to which the term Greenland or Right Whale is applicable is not the only species. For a long time it was believed that this Whale inhabited a very large area of the oceans. Later data, however, go to show that at least five species have existed or still exist, each restricted within a moderately defined area. *B. mysticetus* reaches from the Gulf of St. Lawrence up Baffin's Bay and Smith's Sound, and westwards by Barrow Strait, &c., to the extremity of the North American continent, and descends to Behring Strait, Kamstchatka, and the Sea of Okhotsk. It moreover passes along the Arctic Ocean from Behring Strait to Spitzbergen and the east of Greenland, that is, it has a circum-polar area, in the two points already named descending to lower latitudes.



VIEWS TO ILLUSTRATE POSITION AND STRUCTURE OF BALEEN.

(*Modified partly after Eschricht, Owen, Turner, and Prichard.*)

A, back of skull of Right Whale, looking into mouth, with *w*, whalebone, *m* being maxillary bone of palate, J, lower jaw-bones; B, arch of baleen plates, as seen in cross section of mouth; C, vertical section through gum, palatal, or intermediate substance (*is*) with (*b*) three baleen plates springing therefrom; D, whalebone in cross section under the microscope and showing hair-like structure.

THE BISCAY WHALE (*B. biscayensis*) differs in a proportionally smaller head; shorter, thicker, and more brittle baleen; smoother, thicker skin; and slightly bluish shade of colour. From the eighth to the tenth century the Basque people established a Whale fishery right in the middle of the Atlantic, and even to the beginning of the last century it was known that the same kind of animal was pursued across the Atlantic as far as Florida, and beyond Great Britain towards Iceland. But these hardy seamen followed the Whale with such vigour as to diminish, and, as was believed, drive it within the Arctic circle, an assumption which has disappeared before the knowledge that it differs from the so-called Greenland Whale. Almost between the same parallels in the Pacific Ocean from the American to the Asiatic shores is another—the JAPAN WHALE (*B. japonica*)—pursued by English, American, and Japanese whalers. This black animal, with a white eye-spot and paler on the chin and belly, has slenderer but equally long baleen, and in certain osteological features is regarded as specifically distinct. Another Whale, the CAPE WHALE (*B. australis*), ranges from the Cape region across the South Atlantic to the coast of South America below Brazil. While a fifth, the SOUTH PACIFIC WHALE (*B. antipodarum*), occupies a strip from the South American coast to New Zealand and Australia. The two latter have points in common with the others, and are only distinguished as separate species by supposed structural variations.

The habits of all these animals are exceedingly alike, and only in the first two is there very decided distinction in appearance. Such being the case, we may refer in detail to the Greenland Whale, Bowhead, or great Polar Whale of the Americans. This creature ordinarily attains a length of fifty or sixty or not more than seventy feet. The females are said to be larger and fatter than the males, to produce one or rarely two young ones in the spring, which are suckled for a twelvemonth, and they exhibit a constancy and affection for this offspring not surpassed by any other of the tribe. The bulky body is largest about the middle, tapering rather suddenly towards the tail, the flukes of which are occasionally over twenty feet from tip to tip. The flipper is short and broadish; while the head is a third of the length of the animal. The small eye is placed very low, but nevertheless above the angle of the great arched-mouth. The head is surrounded by a large swelling, at which point the double orifice of the blowhole forms an obtuse angle. The adult is almost black, the young bluish-grey, the lower parts of the throat cream-colour, and occasionally dispersed whitish markings on the body. Gregarious in habit, they go in twos and threes, but sometimes in greater numbers, even in large flocks; but the herds now are indeed rare. Among the most remarkable peculiarities in this Whale are the nature of its food and its mode of feeding. In the high latitudes there floats in immense quantities a small soft-bodied Mollusc (*Clio borealis*), an inch long, with expansions like wings; and besides it there are numerous small Crustaceans and Jelly-fish of various kinds. These, curiously enough, feed on infinitesimally minute Jelly-specks, *Diatomaceæ*, &c. These latter thus form subsistence to the former, which in their turn are the Whale's food; so that, as Dr. Robert Brown has remarked, this enormous marine monster in a secondary manner is sustained by incredible numbers of organisms of which 1,000 or more might be laid on a shilling piece. Captain David Gray, a well-known successful whaler, has given a good account of the mode of feeding. When the animal opens its mouth to feed, the whalebone springs forwards and downwards so as to fill the mouth entirely. When in the act of shutting it again, the whalebone being pointed slightly towards the throat, the lower jaw catches it and carries it up into the hollow of the mouth. They choose a space between two pieces of ice, and swimming backwards and forwards secure the food near the surface. They will continue feeding in this way for hours, afterwards disappearing under the ice to sleep, and again suddenly reappearing as hunger compels them. When the food is submerged ten or fifteen fathoms, after feeding the Whale comes to the surface to breathe, and swallows its mouthful. It then lies still a minute, raises its head partially out of the water, again diving, throwing its tail in the air as it disappears. At such times the whalers successfully harpoon them. Occasionally they are easily captured, but more often are approached with great danger. The periods of surface-breathing and descents in the Right Whale are very different and irregular compared with those of the Sperm Whale. At intervals of from five to fifteen or twenty minutes they rise to breathe, and remain on the surface for about two minutes. Their ordinary rate of travelling is nearly four miles an hour, but if alarmed or wounded their pace is considerably increased. Like the other Whales, they travel head to the wind. They appear to have periods of migration. In May they are found off West Greenland; at the end of June they cross Baffin's Bay, towards Lancaster Sound and Eclipse Bay, whence in August and September they strike south, and in November or later reach Hudson Strait and the coast of Labrador. It is supposed that the young are produced in these lower latitudes, and in spring the Whales are believed to proceed again northwards. This ordinarily quiet, harmless, but unwieldy creature, whose time seems to be divided between feeding and sleeping, occasionally disports itself in fun and frolic, like its more elegant but smaller congeners. It will then throw itself clean out of the water, "lobtail," "breach," and so on.

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* *Balæna mysticetus.*

The whaling ships, which are now most powerfully built screw-propellers, leave Britain in the beginning of May for the Greenland seas, and endeavour to come across the track of their prey in the Baffin's Bay districts. The men in the crow's-nest have a weary and cold outlook, and as opportunity offers chase is given in the whaleboat in these dreary regions under circumstances well calculated to test the bravest spirit. The vessels often hover on the edges of the ice, or ram and bore their way through it, and when Whales are announced they are assailed by the boats' crews with harpoons, lance, and at times harpoon-guns. These Whales when struck will occasionally run out more than a mile of cable, but return to breathe at no great distance, when the lance is used, and the extraordinary loss of blood weakens the monster and lays him at the mercy of his pursuers. Whales that have once been attacked and got free become very cunning, and instead of diving direct go straight along the surface, dragging boats and even ships into most dangerous positions, or cutting the ropes as they seek shelter

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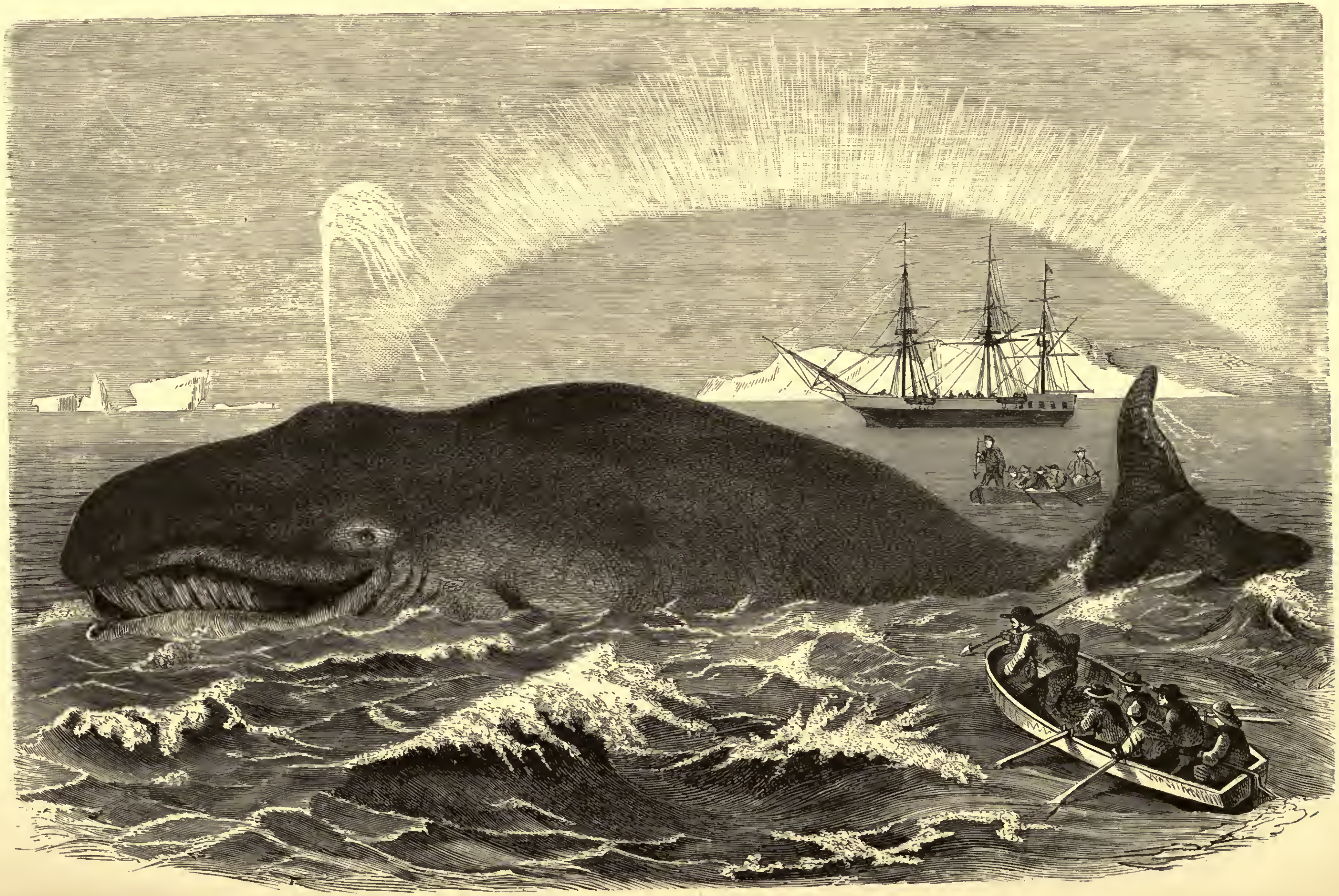

GREENLAND OR RIGHT WHALE.

under the ice. The American whalers on the Okhotsk Sea vary their mode of pursuit according to the district, often landing and even making night whaling expeditions, being guided by the phosphorescence accompanying the creatures' movements. An ordinary-sized Whale, between forty and fifty feet, will yield, according to Scammon, from sixty to eighty barrels of oil, and 1,000 lbs. of baleen. The usual manner is for the Whale to be brought along the port side of the vessel, its tail forwards, belly up, and head aft. Tackled at each extremity, the men with spiked boots commence to strip the blubber, which is hoisted on deck. When the belly and right side with flipper are disposed of, the carcass is canted and the other side is similarly treated. The material is hastily put aside until the first quiet opportunity admits of it being cut in pieces and finally stowed in the holds, where it is kept in perfect safety until the return of the vessel. The skin and waste pieces of flesh or "kreng" are thrown away, and as the carcass and such useless matter are abandoned, they are quickly seized by the Killer Whales, Threshers, and Greenland Sharks, and by enormous numbers of sea-fowl that hover in the wake of the whaler.

HARPOON.

THE HUMP-BACKED WHALES.*—Of this genus three, four, or even more species are named by naturalists. The Long-finned (*M. longimana*), or *Kepokak* of the Greenlanders, inhabits the North Atlantic area as far as Davis Strait. A southern form, the Cape Hump-back (*M. Lalandii*), is distributed over the South Atlantic, also towards both continents. There is a South Pacific form (*M. novæ zelandiæ*), the New Zealand Hump-back, stretching to the American coast, and still another, the Japanese Hump-back (*M. kuzira*), which ranges to the Aleutian and Californian coasts. These Whales are by no means as valuable for oil or baleen as the Right Whale, and are not very frequently hunted. An adult averages fifty feet in length. The skin of the throat and belly is plaited longitudinally like corrugated iron with narrow furrows. The flippers are very long, one-third or one-fourth the length of the animal, their edges often undulating. The characteristic feature or hump, is a low dorsal fin, situate behind the middle of the body. They have a bulky, stoutish body, and a broad flat head, and the neck vertebræ are usually separate. They are black, occasionally paler below, and some have white flippers, but the baleen is black. Dr. Rink says that when struck with harpoon, the Kepokak rushes along the surface without diving. They rest lazily near the surface, beating their flippers as if scratching themselves. The Greenlanders steal up to them when asleep, and stab them with lances. All the species, at times, seem to delight in endless springing and dashing out of the water. They will yield from twenty to thirty barrels of oil, and a few hundred-weight of an inferior quality of whalebone. The Hump-back of the Pacific, according to Scammon, proceeds north in summer, and returns southwards on the approach of winter; but they have been observed with young following them at various times and seasons.

Considerable interest is attached to another Cetacean of the North Pacific, which Capt. Scammon names the California Grey Whale.† The female of this animal is from forty to forty-four, and the male seldom more than thirty-five feet in length. In shape it may be said to be somewhat intermediate between the Right Whale, the Hump-backs, and the Rorquals, though in most respects nearest the last two. It has no back fin or hump, but instead a series of cross ridges on the hinder part of the back towards the tail. Occasionally individuals are nearly black, but the more common and characteristic colour is a mottled-grey or speckled patches of white on all the upper parts, underneath being darkest in body-tint. The flippers are fully six feet long, broad in the middle, but taper to a point. The head arches downwards from the blowhole forwards, and the baleen is remarkably short, brownish-white, and coarse in texture. From November till May this Whale frequents the Californian coast, and then the females enter the shallow bays and lagoons, and give birth to their young, while the males keep seawards. During the summer months they all journey northwards along the coast, and congregate amidst the ice in the Arctic Ocean and the Okhotsk Sea. So regular are their migrations, and so close in-shore do they swim, that Eskimo and Indians alike keep watch at the proper season, and as they pass successfully attack them in their canoes. The flukes, lips, and fins form native dainties, the oil is bartered for reindeer, a

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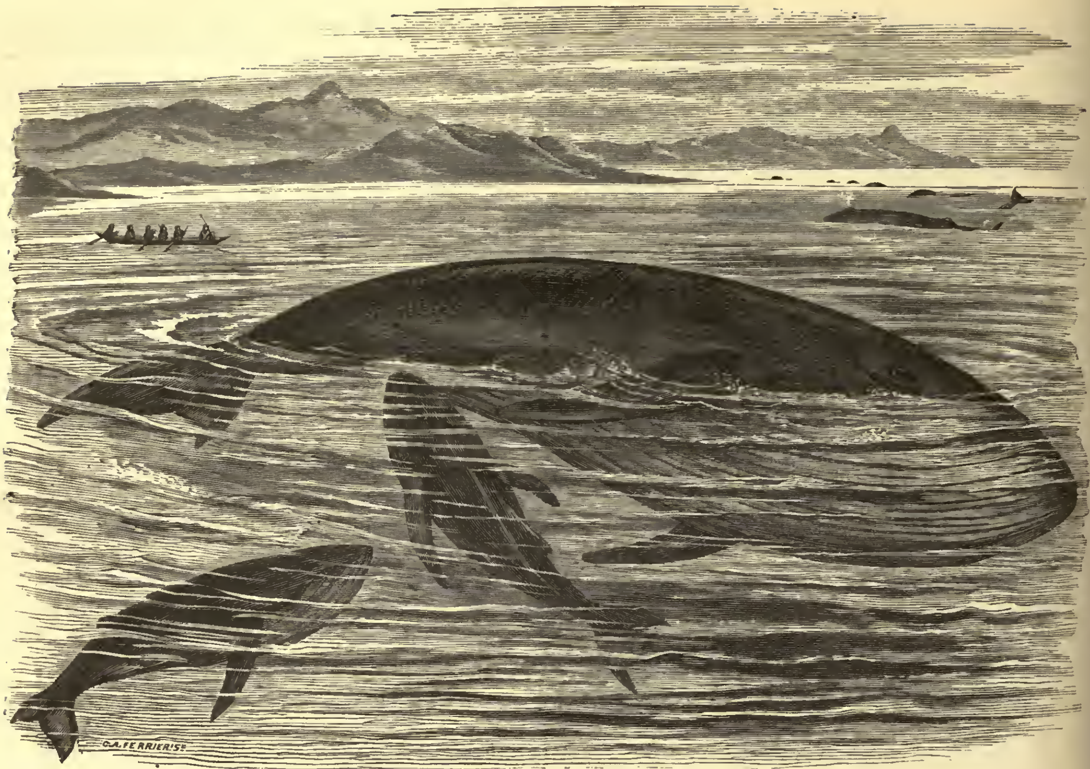
* *Megaptera;* μέγας, great, and πτερόν, fin.

† *Rhachianectes glaucus* of Cope.



HUMP-BACK WHALE SUCKLING HER YOUNG.

sauce is made of the entrails, and the Eskimo dogs feast on the flesh. Since 1851 a system of coast and bay whaling has been profitably pursued by the Americans along the Californian shores. At first 1,000 Whales would daily pass the outlook stations, though not a tenth part are now seen, so great has been the havoc and so shy of the land and whale-boats have the Californian Greys become. In calm weather these Whales will lie motionless for an hour or so on the surface of the water, but they nevertheless seem to delight in dashing and splashing among the surf and breakers. At other times they huddle together in shoal water, almost getting aground, while their young swim freely about in sportive play. The dam's attachment to her offspring is very great, and hence lagoon whaling is most dangerous. Casualties are of constant occurrence in these narrow passages, the old Whale in her frenzy dashing her head against the boats, and lashing all around with her tail-flukes; hence the sailors call them "Devil-fish," and "Hard-head," while "Mussel-digger" is applied to them from their habit of probing among the mud. They often roam among the seaweed-banks, where the whaler shoots them with the harpoon-gun, as he lies in wait in a small boat or sailing craft. Thus this piebald Whale runs every chance of early extinction, seeing that whether in warm or cold latitudes, it is relentlessly pursued by its dire enemy—man.

THE FIN-WHALES, OR RORQUALS,* as a group, vary exceedingly in size. Although at times of great dimensions, they are not so bulky in form and unwieldy as the foregoing whalebone groups. Their elongate bodies, smaller-mouthed heads, shorter baleen, plaited throats, and relatively narrow and small flippers, with a dorsal fin behind the middle of the back, high laterally-compressed tail-root, and separate neck-bones, besides other osteological characters, distinguish them sharply from the preceding. The amount of blubber and baleen in these Whales being exceedingly limited, coupled with their great muscular activity, restless disposition, difficulty and danger of approach, causes them to be seldom hunted. Their capture in fact is not remunerative. As a consequence, their numbers in some districts are considerable though scattered; even off British coasts certain species create great havoc in the herring and other fisheries. There may exist from eight to a dozen fairly-recognised species, and quite as many more doubtful ones. They have been divided into several genera by various naturalists, though there is a tendency to revert to the single term *Balænoptera.* So migratory are they, so active, and changeable towards localities, that little is known of their precise geographical distribution. They are found in the Polar seas, throughout the whole of the Atlantic, in the Indian, Pacific, and Antarctic Oceans. In their habits they have much in common. Ordinarily they do not congregate in large herds, though twos and threes, and occasionally more, keep company; others seem even more solitary in disposition. They are all more or less fish-eaters, and they commit great devastation among the Cod-bearing banks and Herring shoals—six and eight hundred fish having been found in the stomach of an individual. A few attain the enormous length of even 100 feet, and sixty or seventy feet is not an uncommon average, though some of the species are by no means distinguished on account of size. One of the largest forms is SIBBALD'S RORQUAL (*B. Sibbaldii*), black above and slate-grey below, varied with whitish spots. The Icelanders term this animal "Steypireythr," and it is rather abundant in that region and South Greenland. Another of immense dimensions is known to the Pacific whalers as the SULPHUR-BOTTOM WHALE (*B.* (*Sibbaldius*) *sulfureus*). This glides with great velocity over the ocean, and is known at a distance by the vast amount of vapour it sends forth in blowing. Its yellowish belly gives its specific name. At times they appear in considerable numbers on the Californian coasts. One is recorded to have followed a ship for twenty-four consecutive days, and rifle-shots, &c., did not drive it away. The captain and crew at first had great fears of mischief, but at length the companionship of "Blowhard," as they called him, and his close approach, became a subject of interest and merriment to them. The COMMON RORQUAL, or RAZOR-BACK (*B. musculus*), black above and brilliant white below, with an average length of sixty or seventy feet, is a well-known frequenter of British coasts. The LESSER RORQUAL (*B. rostrata*) resembles the last, but never reaches more than twenty-five or thirty feet. It frequents the North Atlantic and Arctic Ocean, and is supposed to stretch even as far as Labrador, Davis Strait. and the Aleutian Isles. It likewise has been met with several times in British waters, but it is best known as the "Seigval," or Cod-Whale of Finland, and from the fact that it is a regular summer visitant to Norway.

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* *Balænoptera;* φάλαινα, a whale, and πτερόν, fin.

A great many of the remains of Fossil Whales found in the Miocene and Pliocene deposits in various parts of Europe belong to the Fin-backs. One genus, the *Cetotherium,* Brandt has suggested, might form a transition between the Whales and our next order, the Sirenia. This supposition, however, is not borne out by facts, such features as denote likeness being rather deceptive. The Rhytina, a Sirenian, wanting teeth and with a somewhat Cetacean-like tail, however Whale-like in outward figure, in other respects is quite different from any member of the Order Cetacea, which taken as a whole cannot possibly be affirmed to show substantial links of close affinity either with the other Marine Mammalia or with the Land Mammalian groups.

JAMES MURIE.

COMMON RORQUAL. (*After Flower.*)

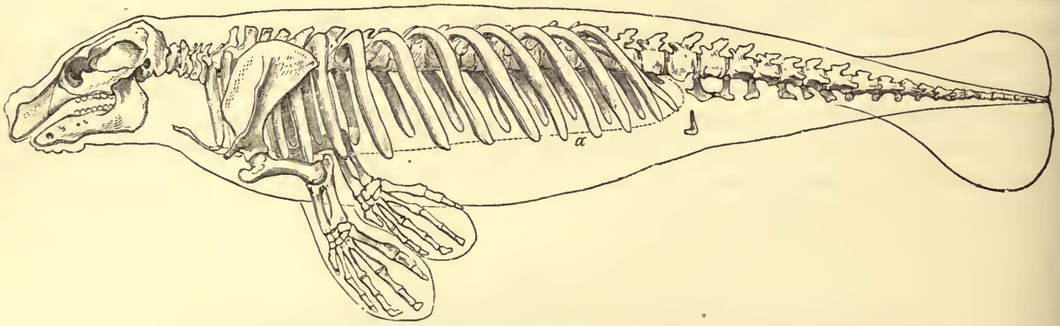
ORDER SIRENIA (THE MANATEES).

Introductory Remarks—Mermaids—Position—General Characteristics of the Order—STELLER'S RHYTINA—Habits—Extinct—DUGONG—Range—Habits—Uses—Teeth—MANATEE—Distribution—Peculiar Mouth—Mode of Feeding—Story of "Patcheley," a tame Manatee—Halitherium and other Fossil Forms.

THIS order of the Marine Mammalia comprises only a few animals, which, however, possess a peculiar interest to the zoologist. But two genera are now found alive, and a third genus was utterly extirpated about a century ago. Others are only known from fossil remains. Notwithstanding the ungainly, almost positively repulsive, appearance of the living forms, they yet have a hold on the popular imagination on account of their being the actual representatives of the famed Sirens and Mermaids of yore. The ancients, in their voyages to Eastern climes, gathered stories concerning the existence of strange creatures, half woman, half fish, chiefly frequenting the shores of Taprobane (Ceylon); and fancy, with oft-told but unchecked repetition of tales, soon lent a charm to the supposed beings, by conferring on these sea-nymphs imaginary flowing tresses, and sweet dulcet voices, by whose luring wiles the unwary mariner was entrapped, or led to destruction. Howsoever ridiculous such notions may now be regarded, they are, nevertheless, to be satisfactorily explained, for the singular Dugong, with its fish-like tail, roundish head, and mammæ on its breast, has the habit of occasionally raising half of its body perpendicularly out of the water and clasping its young to its breast. These actions have, doubtless, given a colourable pretext to all the fables of mermaids—those "missing links," which even yet our children delight in, when narrated in "The Little Mermaid," by the talented pen of a Hans Andersen.

The Manatee or Dugong group, partly from aquatic habitat and some outward resemblances, for long was classed among the Whales; by F. Cuvier they were termed the Grass-eating ("les Cétacés herbivores") in contradistinction to the flesh-devouring Cete, or Whales proper. Early in this century Illiger signalised and defined them as a separate sub-order "Sirenia," their organisation distinctly differing from that of the Whales; while De Blainville, later on, pressed their Elephant-like structures as entitling them to close proximity with these creatures—his "Gravigrades."

Among the general characters of the Sirenia is a long, compact, cylindrical body (without back fin), narrowing towards the tail, which terminates either Whale-like, in forked flukes, or Beaver-like, in a great, flat, fibrous expansion, in either case set horizontally. The fore-limbs are encased, flat, and flipper-like, exceedingly flexible, and more completely formed than in Whales. The extinct and fossil Halitherium alone is known to have possessed rudiments of hind-limbs, though pelvic bones are present in all. Ears are wanting, and the eyes are very small, whilst two valvular nostrils are situate over a full prominent muzzle, which is provided with a copious supply of peculiar short bristles, while the inside angles of the mouth are hairy. Their dark skin is Elephant-like, tough, rough, sparsely hairy, or smoothish and Whale-like. The two mammæ are on the breast close to the armpits. One genus (Rhytina) was toothless, but the others had ample dentition. Moreover, in all the front of the upper and lower jaws is provided with curious, rough, horny pads or plates. The larynx differs from that of the Cetacea and resembles that of Land Mammals. The midriff, or



SKELETON OF MANATEE. (*Modified after De Blainville.*)
a, Dotted outline of Lungs.

diaphragm, is most unusually lengthened backwards. The apex of the heart is cleft, giving the appearance of a double organ, and the blood-vessels almost everywhere in the body and limbs split into *rete mirabile.* The stomach has two main digestive chambers, and to the first is added a pair of small divergent horn-shaped appendages, besides a remarkable finger-shaped gland. Unlike Whales or Elephants their small brain has few convolutions. All the bones are dense and heavy, and are the most solid among Mammals. Manatus is unique among the living Mammalia in having but six neck vertebræ, and, as in the other Sirenia, they are all separate. The ribs are uncommonly thick. The skull is relatively much smaller than in the Cetacea, is low set, somewhat elongated, and truncated at each extremity. The side bones (*parietals*) meet above, the occiput is small, the orbits well defined, and the nasal passages are directed forwards; the lower jaw has a high vertical limb (or ramus) behind, and in the Dugong the upper and lower jaw-bones are strangely bent down. The Sirenia are animals of slow habit, and are most inoffensive. They feed solely on aquatic vegetation. As being the most Whale-like in size and shape of tail, we shall first introduce to notice the Rhytina.

STELLER'S RHYTINA,* the Morskaia Korava of the Russians, and alone representative of the genus, is a creature now extinct, but which was living and in tolerable abundance a hundred and fifty years ago. When the Russian, Behring—after whom the Strait is named—first visited that region and the neighbourhood of Kamstchatka, there existed a huge animal, of which, under the name of Manatee, or Northern Sea Cow (*Vacca marina*), the naturalist Steller, who accompanied him, gave a classical account. It had a small oblong head, a full bristly snout, a dark-coloured body, protected by a rugged, gnarled, warty, hairless skin. The fore limbs were quite short and stumpy, hairy at their ends, and they had no finger-bones beyond the wrist. The tail was black, ending in a horizontal, stiff, half-moon-shaped, narrow fin-blade, fringed with a fibrous whalebone-like material. It had no teeth, but horny, almost bony plates, corresponding to the horny gum-pads of the Dugong and Manatee, served the purpose of mastication. According to Steller, it attained a length of from twenty to twenty-eight feet.

Though stupid, voiceless, animals, they were of a very affectionate disposition, and were readily tamed, even allowing themselves to be handled. Their conjugal affection was strikingly developed. A male, who in vain attempted to relieve his partner, stuck by her, in spite of repeated blows, and when she died he returned to the spot for some days, as if he expected to see her again. They were very voracious, and fed on seaweeds, with their heads under water; and every now and then they raised their noses to breathe, and made a snorting noise. They appeared in families, each consisting of a male, female, one half grown, and a cub born in autumn; and sometimes these families united into great herds. As they were very good eating (far preferable to salt junk), Steller recommended them as articles of diet to the sailors; and so faithfully was his advice observed by natives and seamen, that within twenty-seven years of his first visit the last Rhytina was killed, namely, in 1768. They were hunted with a boat-hook attached to a long rope, which, when the animal was struck, was passed to a company of men on shore, who, with considerable difficulty, managed to land the huge Sea Cow. This animal appears to have had an extremely limited range, having never been met with anywhere but in the small Behring Island, off the coast of Kamstchatka. Their sudden extinction is a most noteworthy fact, and but for Steller's admirable account nothing whatsoever would have been known of the habits, internal structure, or outward appearance of this singular Sirenian. Though the adults were toothless, yet by some it is supposed from analogy that in early life functionless teeth may have existed, though these never appeared above the gums. The Rhytina, in its forked tail, somewhat down-bent jaws, and other points, resembled the Dugong; while in skull characters and skin it was like the Manatee; and though somewhat whale-shaped, it was a true Sirenian.

THE DUGONG,† typical of the genus Halicore, is a living form, ordinarily from ten to twelve feet long, though very old males are said occasionally to reach as much as eighteen to twenty feet. Its distribution is rather widespread, namely, from the Red Sea and East African coasts to the west coast of Australia; and they are even yet not unfrequently met with within these limits, on the coasts of Mauritius, Ceylon, and the Indian Archipelago, though in numbers fast becoming thinned. Outwardly they differ from the Rhytina in being smoother-skinned, and in having the fore-limbs longer, and the tail semi-lunar, but deeper or less fluked, and not marginally split. Their colour is slaty-brown or bluish-black above, and whitish below. The early traveller, Leguat, speaks of droves of several hundreds grazing like Sheep on the seaweeds a few fathoms deep in the clear waters of the Mascarene Islands. Usually this tropical animal frequents the shallow smooth waters of the bays, inlets, and river estuaries where marine vegetation (fucus and seaweeds) is in abundance, and there it leisurely feeds, being lethargic in disposition, but an immense eater. When they have not been much chased they are not shy or timid, and even allow the natives to handle them; on which occasions the admiring spectators generally manage to abstract the smaller and fatter cubs as dainties, for they are considered uncommon good food. So highly prized are they, that the Malay king considers it a royal "fish," and he claims all taken in his dominions. The flesh of the young, when cooked in a variety of ways, is certainly wholesome—by some compared to veal, and by others to beef or pork—but the older animals are tougher. The Moreton Bay colonists call them "Sea Pig." They yield a clear oil of the best quality, which is free from all objectionable smell, and it is strongly recommended as a remedial agent in lieu of cod-liver oil. Hence an Australian Dugong fishery has been established; but its equipped boats' crews are fast sweeping off the once plentiful numbers. The stories of their being found ashore, browsing on land herbage, are not supported by fact; indeed, the inadequate strength of their fore-limbs, the absence of hind extremities, and their unwieldy bodies, prevent them from travelling on land. This is borne out by the statements of the natives of Sumatra to Sir Stamford Raffles, as well as other travellers. The Red Sea Arabs told Dr. Rüppell that they had feeble voices, a fact that other Australian observers have corroborated, although the roaring of Seals has been mistaken for them. In the spring months the males do battle for partners, and the young are born towards the end of the year. Like the Rhytina, the Dugong shows intense maternal affection, for if the young be taken, the mother suffers herself to be speared in following her offspring. In its strange bristly-clad muzzle the Dugong resembles its congeners, but its skull and dentition are singular. Thus, the fore or premaxillary region of the upper jaw is elongated, sharply crooked downwards, and overlaps the very deep lower jaw, which is similarly down-bent. The two opposed surfaces bear the horny tuberculated plates which rub and grind the vegetable food. The dental formula ordinarily is—Incisors, $\frac{1-1}{0-0}$; canines, $\frac{0-0}{0-0}$; molars, $\frac{3-3}{3-3} = 14$. The pair of incisor tusks are lodged in the down-bent upper jaw, and protrude in the male, but in the female they are diminutive, and retained within the bone. Behind them there is a considerable space devoid of canine, and then come three slightly laterally compressed ovoid molars without enamel. The molars, however, may occasionally be five in number, the fore ones dropping out, and others behind taking their places, but not succeeding vertically. In some instances the males have an additional lateral small incisor. Thus as many as twenty-four teeth may be developed, but these are never in use at one and the same time. This peculiar dentition, and the successive displacement of the anterior molars, foreshadows what is regularly found in the Elephants and Mastodons.

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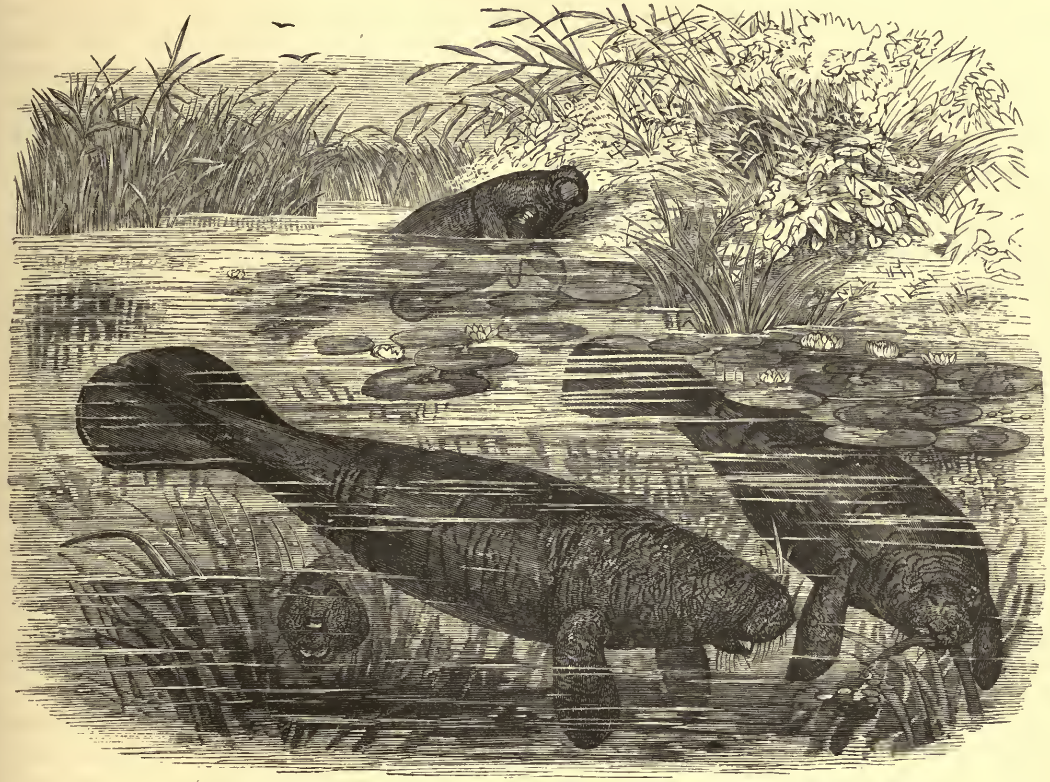
* *Rhytina Stelleri.*

† *Halicore dugong.*

The MANATEE, or *Lamantin* of the French, inhabits the African and American Continents. In Africa it ranges along the west coast, and ascends the Senegal, Niger, Congo, and other rivers, where it not only frequents the lagoons, but even has been captured in Lake Tchad. This animal is known as *M. senegalensis.* In America two forms are supposed to exist—one, the *M. latirostris,* of Florida, is said to have closer resemblance to the African form than to its fellow-countryman; the other, *M. americanus,* is found in Surinam, Guiana, Jamaica, the Amazon and its tributaries, and, indeed, in the various rivers, bays, and inlets of the tropical American coast. These creatures, like the foregoing, browse upon the aquatic vegetation of the shallow lagoons and river banks, apparently, however, having a preference for fresh-water plants. Their habits and mode of feeding are, in a measure, similar to those of the Dugong and the Rhytina. The full-grown Manatee is from ten to twelve feet in length. Its long body terminates in a thin, wide, shovel-shaped, fibrous, horizontal tail, proportionally broader, but resembling somewhat that of the Beaver. The fore-limbs, or flippers, have diminutive flat nails. The skin of the body can be compared only to that of the Elephant, not in colour alone, but also in its coarse, wrinkly texture, and widely-scattered, delicate, but long hairs. Its deep-set, minute eye is surrounded by skin wrinkles. As in the preceding genera, the muzzle is peculiar—a kind of half-moon-shaped swelling above, with deep crossing wrinkles set with short stiff bristles. Beneath this there projects a mass of hard gum, covered with a roughened horny plate. The lower jaw also has a gum plate, underhung by a bristle-clad lower lip. The



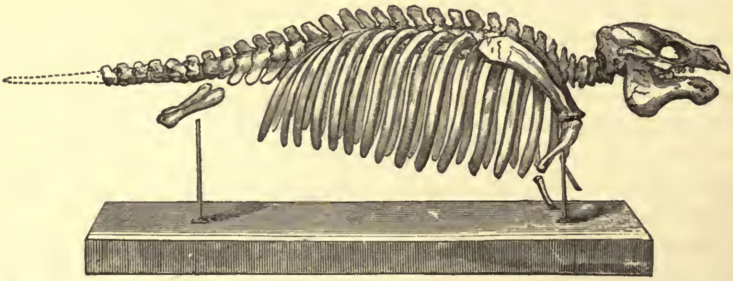
MANATEES.

nostrils are two semi-lunar, valve-like slits, at the apex of the muzzle. When the mouth is opened, the marginal inner cheeks are seen to be hair-covered, and the hard, horny palate to be very conspicuous above and below. This remarkable muzzle and mouth are specially adapted to the animal's mode of feeding. Steller long ago remarked that the Rhytina's muzzle was exceedingly prehensile; but in a live Manatee exhibited at the London Zoological Gardens, Professor Garrod observed and has recorded the remarkable manner and use of this lip-structure. In grasping its food, the bristly-clad outer angles of the upper lip at first diverge, and then approximate like a pair of pincers, holding the object firmly, which is then drawn inwards by a backward movement of the lips. The horny pads again on the closing of the mouth further bruise the vegetable matter. In 1866, the Zoological Society sent Mr. Clarence Bartlett to Surinam, to bring home a young Manatee. This suckling, christened "Patcheley," had been obtained when quite a baby by the Indians, and duly transferred to a lakelet, where he had his freedom. Although fishy in form and fondness for the water, he had nevertheless to receive daily a good *quantum* of Cow's milk from a bottle. He soon got fond of the "black Jack," as well as of his keeper. Mr. Bartlett, as wet nurse, had a difficulty in training his charge. Loosely attired, he waded about and coaxed his pet to the water's edge, where, after a stolen suck or two, he permitted himself to be raised partly on his knees, and then sucked away might and main till the bottle was dry. His appetite satisfied, he seemed in high glee, tumbled and rolled about a while, then got quieter, retired to the pool, and slept lazily near the surface. At times his disposition was more rollicking, and Master Patcheley would overturn his nurse into the mud, where the two spluttered and floundered for possession of the bottle. Clusius recounts how a pet "Mato" was kept by a Spanish Governor for twenty-six years; it came at call to the side of the lake to be fed, and would even allow boys to mount on its back while it harmlessly swam about. For long the pursuit of the Manatee has been a favourite amusement with the natives. One instance is related of Indians on the Mosquito shore spearing it from canoes, when the animal darted off as he felt the weapon, dragging the canoe after it round and round the bight until exhausted. Mr. Alfred R. Wallace says the natives of the Amazon capture them alive, in strong nets, at the mouth of the streams, and afterwards kill them by thrusting wooden plugs up their nostrils. The Manatee has no milk-teeth, though when young there are two rudimentary incisors in each jaw, which afterwards become covered in. Canines are entirely absent, and the molars vary in number from nine to eleven in the upper and lower jaw on each side. Those in the upper series are three-rooted, in the lower series two-rooted; all the molars are broad, square-crowned, and with transverse ridging or cusp structure like that of the Hippopotamus or partly like that of Mastodon. The molar series are never simultaneously in place and use, those in front dropping out and making room for those behind.

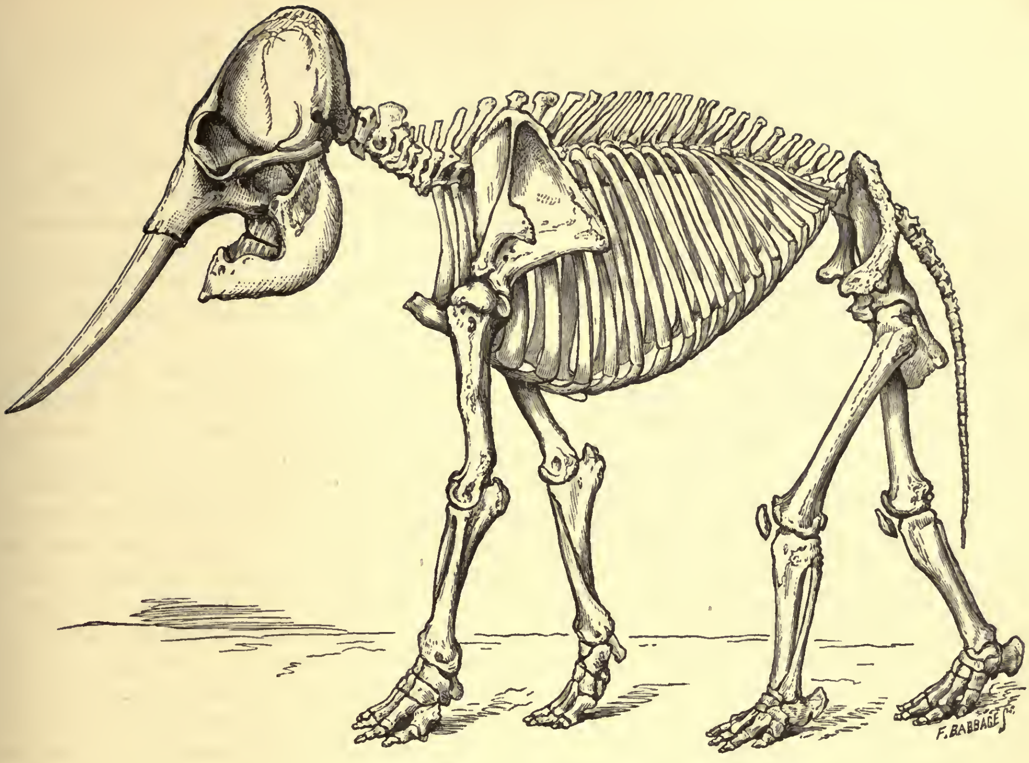
FOSSIL SIRENIA.—The HALITHERIUM is the name given to certain fossil remains which have been found in the Miocene strata of Germany and various other parts of Europe. These remains show that there may have been several species, but all are truly of a Sirenian character. The fossil remains were intermediate, though possibly most closely allied to the Manatee, some of them being slightly larger than this animal. The dentition is unusually interesting, inasmuch as there appear to have been vertical successors; anteriorly there are simple, cylindrical premolars, and posteriorly larger, complex molars, while the somewhat bent-down upper jaw bore tusk-like appendages. But the most peculiar and interesting point in connection with the Halitheria, is that they were provided with rudiments of a hind limb, a thigh-bone some few inches in length having been found by the late Professor Kaup, though curiously enough no further vestige of it has since turned up. Judging from the almost complete skeletons obtained, and from comparison with what we know of other Sirenia, the Halitherium must have closely resembled the living Manatee, and possibly have lived in the lagoons and brackish waters of mid-Europe and elsewhere, for in the Eocene and Miocene times these regions, now high and dry, formed watery areas in communication with the ocean.

Besides the foregoing, within the last few years our knowledge of Sirenoids has been considerably augmented by the discovery of other fossil remains indicating several new genera. *Prorastomus* is founded by Owen on a skull from West Indian (doubtful) Tertiary strata. *Crassitherium* is applied by Van Beneden to vertebræ, and part of a skull from deposits near Antwerp. *Felsinotherium* (with but $\frac{5-5}{5-5}$ molar teeth) is a form described by Capellini, from Pliocene beds in Bologna. *Pachyacanthus*, found in strata in the neighbourhood of Vienna, Brandt supposed a Cetacean, but Van Beneden regards it as a Sirenian. The *Rhytiodus*, of Lartet, is based on some fossil teeth bearing resemblances to those of the Dugong. Lastly comes (in the cast of a brain), the still more remarkable *Eotherium* of Owen, from the nummulitic Eocene of Egypt. Some of these fossils are of intense interest, for example, *Prorastomus*, the Tapir-like dentition of which is—Incisors, $\frac{3-3}{3-3}$; canines, $\frac{1-1}{1-1}$; premolars, $\frac{5-5}{5-5}$; molars, $\frac{3-3}{3-3} = 48$. Very interesting also are *Pachyacanthus*, with possibly but six neck vertebræ, like the Manatee; and *Halitherium*, with its hind limb bones, and which also, along with *Felsinotherium*, foreshadows the molar pattern of Hippopotamus. Thus, taking these facts into consideration, together with many other structural peculiarities, Elephant-like and otherwise, and notwithstanding that the Sirenia are aquatic and Whale-like, their structural relationship with the Proboscidea and Ungulata is not so far-fetched as at first sight might seem. But the gap is not yet bridged, and until that is done the order Sirenia must be retained.

JAMES MURIE.



MOUNTED SKELETON OF HALITHERIUM, IN THE HEIDELBERG UNIVERSITY MUSEUM.


F. BABBAGE Sc.

SKELETON OF INDIAN ELEPHANT.

ORDER PROBOSCIDEA (ELEPHANTS).

Order Proboscidea—Antiquity of the Elephant—Referred to in the Bible—Mentioned in the Apocrypha—War Elephants—Their Accoutrements—Hannibal's Elephants—Elephants amongst the Romans—Skull—Dentition—Vertebræ—Odd Delusion about its Legs—Proboscis—Species—THE INDIAN ELEPHANT—Size—Range—Habits—Various Modes of Capture—Keddah—Used as a Labourer or Nurse—Sagacity—White Elephants—THE AFRICAN ELEPHANT—Characteristics—Range—Habits and Haunts—Hunting—Pitfalls—Aggageers Chasing—Elephant-Shooting—How the Natives Cut it up—FOSSIL ELEPHANTS AND THEIR ALLIES—Absurd Stories—MAMMOTH—How it was first Found—Story of the Fourth or Benkendorf's Discovery—Range—MASTODON—DINOTHERIUM.

THE Elephants, Horses, Rhinoceroses, Tapirs, Coneys, Pigs, and Hippopotami, were all grouped together by the older naturalists under the order of Pachyderms,* or thick-skinned animals provided with hoofs, but not furnished with a complex stomach for rumination, or chewing of the cud. They are now divided into three different orders—the Proboscidea, Hyracoidea, and Ungulata—which we shall define and describe each in its proper place.

The order Prosboscidea, or animals possessed of a proboscis, or trunk, consists of two living species, the Indian and African Elephant, and two extinct genera known as Dinotherium and Mastodon. The Elephant, from its large size and its singular sagacity, attracted the attention of man in the earliest times, and was always looked upon with feelings of awe and reverence. At the present time the African savage, in the region of the Congo, compasses its death with the mysterious aid of the medicine-man, according to Mr. Winwood Reade, as well as by the ordinary means of hunting. The animal, in early times, was used both for purposes of war and peace, and figures, at the present time, alike in the gorgeous retinues of Indian princes, and ministers to the more humble and more useful services of the husbandman. The ivory furnished by its tusks was known in the remotest antiquity. The first undoubted mention of the Elephant in the Bible relates to the use of ivory, which certainly was employed by the ancient Greeks, Assyrians, and Egyptians early in their history.

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* παχὺς, thick; δέρμα, skin.

King Solomon had a throne of ivory, which was obtained through the Phœnician traders probably from Africa. "For the king had at sea a navy of Tharshish (Cilicia) with the navy of Hiram; once in three years came the navy of Tharshish, bringing gold, and silver, ivory, and apes, and peacocks" (1 Kings x. 22.) Elephants are also mentioned in 2 Chron. ix. 21; and at considerable length in the first and second books of Maccabees, where their use in war is described (1 Macc. vi. 28—30; 43—46).

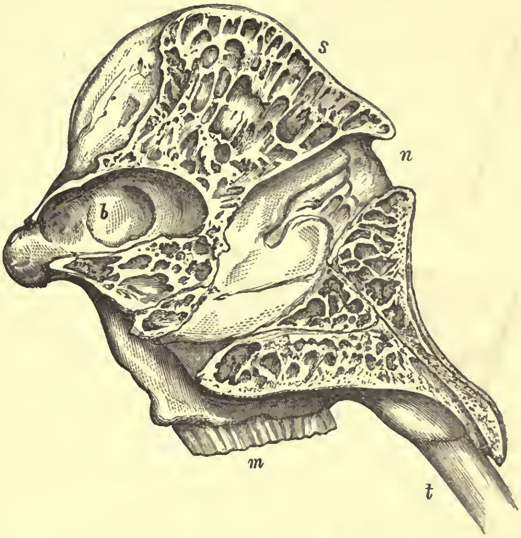
The Elephants were used in war also by the Indian nations, and were looked upon as most formidable engines in battle. By the aid of these huge creatures, to a large extent, they conquered and held possession of the region of Central Asia west of the Indus.

It appears that the relative force of Elephants in a great army corps was one to each chariot of war, with three horsemen and five archers, the latter being perched on the Elephant's back within a houdah of a defensible nature, denominated a castle, the whole forming what was termed a patti, or squad, comprising altogether not more than eleven men, with the drivers or attendants. This shows that in India, which furnished Elephants and the manner of arming them, only four or five archers, with or without the mahout, or driver, were told off to each animal; consequently, when the successors of Alexander introduced them in their wars in Syria, Greece, and Italy, they were not encumbered with more than one or two additional persons before a charge. Indeed, considerable trouble appears to have been taken that a war Elephant should not be nearly as heavily laden as one simply used for carrying burdens; therefore the number of thirty-two soldiers given in Maccabees as seated upon each Elephant must somehow or other be a mistake. These Elephants were well trained, and taught to hold out one of their hind legs horizontally, when it was necessary to mount them in a hurry. They appeared to take considerable delight and satisfaction in the gaudy trappings with which they were usually decorated. In some cases, Elephants have proved more dangerous to the army in whose ranks they were serving than to the enemy, by being suddenly confronted with objects previously unobserved. On such occasions they turn in haste, and spread terror and death into their own ranks. Careful, judicious, and long-continued training was the only remedy against these sudden surprises.

African Elephants probably were never so well trained and subdued as the Indian; nevertheless, they were used by the Carthaginians in the first Punic War (264-241 B.C.) with much success, and to the discomfiture of the Romans. In the second Punic War (218-216 B.C.) Hannibal performed the most astounding and remarkable feats of crossing the Pyrenees, making his way through Gaul, crossing the Alps with thirty-seven Elephants, and defeating the Romans at the Ticinus. Most of the Elephants, however, died shortly afterwards from the excessive coldness of the weather and the fatigue they had undergone. Various accounts are given in Roman history regarding the manner in which the Elephants crossed the Rhone. One story goes that they were assembled together on the bank, and the fiercest of them being provoked by his keeper, pursued him as he swam across the water, to which he had run for refuge, and that the rest of the herd followed. There is, however, more reason to believe that they were conveyed across on rafts. It is said that one raft two hundred feet long and fifty broad was extended from the bank to the river, and was then secured higher up by several strong cables to the bank, that it might not be carried down by the stream. The soldiers then covered it over with earth, so that the animals might tread upon it without fear, as on solid ground. Another raft one hundred feet long, and of the same breadth as the other, was joined to this first. The Elephants were driven along the stationary raft as along a road, and then, the females leading the way, passed on to the other raft, which was fastened to it by lashings. This, on being cut, was drawn by boats to the opposite shore. The Elephants gave no signs whatever of alarm, while they were driven along as it were on a continuous bridge; but a few became infuriated when the raft was let loose, and fell into the river, finding their way, however, safely to the shore.

The trappings and armour of a war Elephant have been described by the author of the "Ayeen Akbery" as follows:—"Five plates of iron, each one cubit long and four fingers broad, are joined together by rings, and fastened round the ears of the Elephant by four chains, each an ell in length; and betwixt these another chain passes over the head, and is secured beneath; and across it are four iron spikes, with ratasses and iron knobs. There are other chains with iron spikes and knobs, hung under the throat and over the breasts, and others fastened to the trunk; these are for ornament and to frighten Horses. Pakher is a kind of steel armour that covers the body of the Elephant; there are other pieces of it for the head and proboscis."

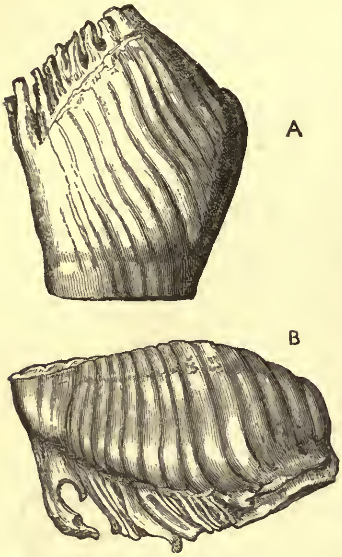
History informs us that when Timour, or Tamerlane, attacked the dominions of the Sultan Mahmoud (A.D. 1399), the Elephants, of which the latter had a considerable number, caused great terror and alarm; and that the preparations made by Timour to overcome the Elephants were of the most extraordinary nature, for not only did he surround his camp with a deep ditch and bucklers, but also had Buffaloes tied together round the ramparts, with huge brambles on their heads, which were to be set on fire at the approach of the Elephants. The forces of the Sultan, besides the Elephants, consisted of a large number of horse and foot soldiers armed with swords and poisoned daggers. Attendant upon the Elephants were men armed with fire, melted pitch, and other horrid missiles, to be hurled at the invaders. The Elephants also, besides being armed, were decorated with all sorts of articles, such as cymbals and bells, and other objects likely to create a noise and confusion. Notwithstanding all this terrific display, Timour's forces fought with great courage, actually defeating the Sultan's forces, and putting the Elephants to flight, the unfortunate creatures undergoing severe usage to their trunks by the swordsmen, who appeared soon to find out the more vulnerable parts. It is said that the trunks of many of the Elephants were left scattered on the battle-field, having been severed by the sword. The belief in the invincibility of the Elephants was then for ever gone; and it is even said of Timour's grandson, then quite a boy, that he himself wounded an Elephant, and drove it in as a captive to his grandfather's camp.



SECTION OF SKULL OF INDIAN ELEPHANT.
s, Air Sinuses; *n*, Nostrils; *b*, Brain; *m*, Molar; *t*, Tusk.

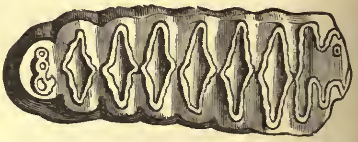
We are told that in ancient times the number of Elephants annually brought from Africa to Rome, to be trained for the cruel and disgusting practice of fighting in the theatre, was very great. It is said of Pompey that, at the dedication of his theatre, no less than five hundred Lions, eighteen Elephants, and a number of armed men, were all at one time in the circus. In the second consulate of Pompey (54 B.C.) Elephants were opposed, in the circus, to Getulian archers; and, according to Pliny, this exhibition was characterised by some uncommon circumstances. One of the Elephants, although furious from a wound, is recorded to have seized upon the shields of his adversaries, and to have thrown them in the air with a peculiar movement, doubtless the effect of training, which caused the shields to whirl round before their fall. It is also stated that an Elephant, having been killed by a thrust of a javelin through the eye, the others rushed forward in a general charge to save him, and that on their coming with terrific force against the iron railings, the latter gave way, and several of the spectators were either injured or killed. On another occasion, when some Elephants, with other wild animals, were fighting together in the arena, the spectators so compassionated the unfortunate creatures, who were raising their trunks to heaven and roaring piteously, as if imploring aid of the gods, that they rose from their seats, and, disregarding Pompey's presence, demanded that the Elephants might be spared. The destruction of Elephants in sport by the Romans, as well as the increased demands of the ivory trade, have caused the African Elephants to disappear from those regions of Northern Africa which they once inhabited. In the days of the Carthaginians, the animal was found north of the Sahara, where at present it is unknown.

The skull of the Elephant is remarkable for its great size, and the comparatively small cavity occupied by the brain. The latter is small in comparison to the size of the animal, in bulk not much exceeding that of man. Although the bones of the skull are so large, they are not solid, their interior being occupied by hollows divided from each other by thin partitions, by which means the skull is rendered lighter than might be supposed; and altogether it forms a beautiful instance of a provision for increasing the surface for attachment of muscles, without being too great a burden to its possessor. The skull of the Indian Elephant is of a much more pyramidal and less shapely form than that of the African.



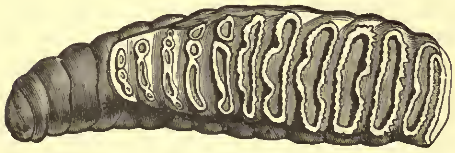
SIDE VIEW OF MOLAR TOOTH OF INDIAN ELEPHANT.
A, Upper; B, Lower.

The dentition in the Elephants presents several points of considerable interest. In the Indian species, the males alone have well-developed incisors; while both sexes of the African species are provided with them. These—more commonly known as tusks—grow to an enormous size, sometimes reaching the weight of from a hundred and fifty to two hundred pounds. There are no lower incisors, and only two of the molar teeth are to be seen at each side of the jaw at one time. There are six of these in each side, or four-and-twenty in all, in the lifetime of the Elephant, and these present a gradual increase in size as they successively appear. These teeth move forward into their working place in the jaw in regular succession, from behind forwards, each being pushed out by its successor as it gradually becomes worn away. The teeth are worn away, not merely by the food on which the animal lives, but also by the particles of sand and grit entangled in the roots of the herbs torn up for food, and their wear is compensated by the growth and development of the succeeding teeth. In a state of captivity, however, where the food is much more free from extraneous substances than in a state of nature, the teeth are not worn away fast enough to make room for the development of the successors, and it therefore frequently happens that the tooth is deformed by a piling over of the plates of which it is composed.



LAST LOWER TOOTH OF AFRICAN ELEPHANT.

The molar or grinding-teeth of the Elephant are for the most part buried in the socket, and present little more than a surface for mastication above the gum. Each is composed of a number of transverse perpendicular plates, built up of a body of dentine, covered by a layer of enamel, and this again by a layer of cement, which fills the interspaces of the plates, and binds together the divisions into one solid mass. Each of these enamel plates, however, in the perfect tooth is united at the base. When these plates of enamel—which stand out in the transverse plates on account of their superior hardness, and cause the grinding surface to be uneven—are worn out, the animal either dies of indigestion, or more often becomes weak, and falls a prey to wild beasts.



LAST LOWER TOOTH OF INDIAN ELEPHANT.

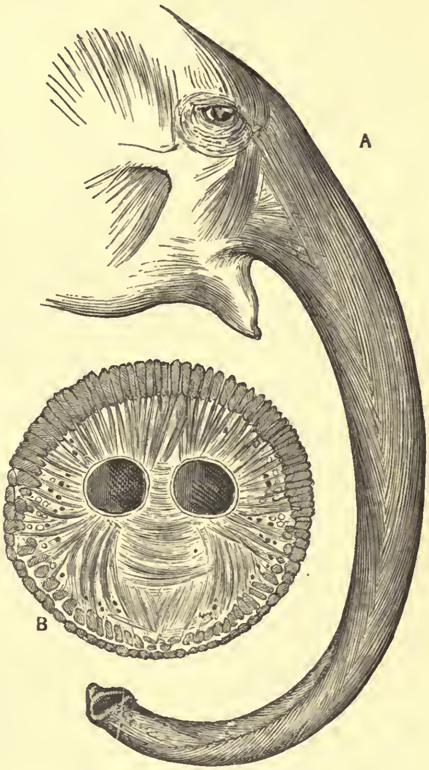
The difference between the grinders of the Indian and African Elephants is well defined. In the former, the transverse ridges of enamel are narrower, more undulating, and more numerous than in the African, in which latter species the ridges are less parallel, and enclose lozenge-shaped spaces. The cervical vertebræ form a short and stiff series, allowing but a limited motion of the head from side to side, a more extended action being rendered unnecessary by the flexibility of the trunk. With regard to the dorsal vertebræ, they appear to vary in number in both species. In the African species the number varies from twenty to twenty-one, and in the Indian species from nineteen to twenty. As might be expected, the limbs of the Elephant are massive and powerful. In ancient times it was a popular delusion that the legs of an Elephant possessed no joints; and even now people are to be found who believe that the Elephant's joints move in a contrary direction to that of other quadrupeds. Shakspere evidently enjoyed the popular belief. In *Troilus and Cressida,* Ulysses, speaking of the stiff demeanour of Ajax towards Achilles, says :—

> "The Elephant hath joints, but none for courtesy,
> His legs are legs for necessity, not for flexure."

And so in Chapman's drama (1605) of *All Fools* we read :—

> "I hope you are no Elephant, you have joints."

These ideas originated from the peculiar gait of the Elephant.



TRUNK OR PROBOSCIS OF ELEPHANT.
A, Muscles and Tendons; B, Transverse Section.

The shape of the Elephant is so familiar to every one that it is only necessary to remark that the ponderous body, clad in a thick and almost hairless skin, has the fore-quarters higher than the hinder parts, and that the thigh in the hind leg is long and straight when the animal is standing. The knee is visible below the body, and bends so as to bring the foot in the rear. On comparing an Elephant and a Carnivore, and their skeletons as well, the arrangement of the joints of the hind quarters will be noticed to be different. In fact, the bend of the Elephant's knee gives the gait of the huge creature an appearance unlike that of any other animal. It stands on the ends of its five toes, each of which is terminated by comparatively small hoofs, and the heel-bone is a little distance from the ground. Beneath comes the wonderful cushion, composed of membranes, fat, nerves, and blood-vessels, besides muscles, which constitutes the sole of the foot. The fore-foot is larger than the hind one, and as the creature does not require to climb, or to lift its fore-limb very high, there is no collar-bone. In the young there is more hair on the body than might have been expected, and they have a set of milk teeth.

The brain is greatly convoluted on the surface, but the little brain, or cerebellum, is not covered by the brain proper.

The trunk or proboscis of the Elephant, from which the name of the order to which this animal belongs is derived, is certainly a remarkable and wonderful organ. It is really a prolongation of the nose, of a sub-conical form, consisting of two tubes divided by a septum. At the extremity on the upper side, above the opening of the nostrils, is a lengthened process to be looked upon in the light of a finger; beneath this finger is a tubercle, opposable to it, and acting, so to speak, as a thumb. With this organ, which is nearly eight feet in length, of considerable stoutness, and extreme sensibility, the Elephant is enabled to uproot or shake trees, lift a cannon, or pick up a pin. By its aid, food and water are carried to the mouth, and when necessary, it can be converted into a syringe or a shower-bath. The length of the organ does away with the necessity of a long neck, a short and muscular neck being absolutely required for the support of the enormous head and tusks.

The principal characters of the Indian species, as compared with the African, are the small ears, concave forehead, small eye, lighter colour, and the possession of four instead of three nails or hoofs on the hind foot. There is also a very remarkable difference in the teeth, those of the Indian species being built up of a series of plates much more numerous and more closely packed together than in the African species.

THE INDIAN ELEPHANT.*—There are but two living species of Elephant—the Indian (*Elephas indicus*) and the African (*Elephas africanus*), although some naturalists have considered the Elephant of Sumatra and Ceylon to be a distinct species, and Schlegel has separated it from both the Indian and African, and defined it as *E. sumatrensis.* It has been, however, shown by Dr. Falconer and others, that although certain differences are to be noticed, they are not of sufficient value to create a new species; but they are still of sufficient importance to form a variety.

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* *Elephas indicus.*

In size, notwithstanding the differences of opinion to be found between certain writers on this subject, some saying that the Indian and others that the African Elephant is the larger, it seems perfectly clear that there cannot be much difference between the two species, and that the maximum height is about eleven feet.

The Indian Elephant (where the progress of civilisation has not interfered with it) is found over the greater part of the forest lands of India, Ceylon, Burmah, Siam, Cochin-China, the Malay Peninsula, and Sumatra; but it is doubtful whether it is indigenous to any of the other islands of the Eastern Archipelago. Unlike the African species, to a certain extent, it appears to have a partiality for coolness and shade; indeed, Sir J. Emerson Tennent says that "although found generally in warm and sunny climates it is a mistake to suppose that the Elephant is partial either to heat or to light. In Ceylon, the mountain tops, and not the sultry valleys, are its favourite resort. In Oovah, where the elevated plains are often crisp with the morning frost, and on Pedura-talla-galla, at the height of upwards of eight thousand feet, they are found in herds, whilst the hunter may search for them without success in the hot jungles of the low country."

In some parts of the country Elephants are exceedingly destructive to crops of grain. And in various parts of India, notwithstanding the care and trouble taken to watch the crops, they do much injury. When the rice approaches maturity it is necessary to place watchers throughout the night in places which they frequent. Stages are erected on posts twelve or fourteen feet high, and on one side of the stage a small shed is made for the watchmen, two of whom always mount the same stage. One feeds a fire kept constantly burning on the open part, while the other in his turn is allowed to sleep, and when any Elephants come into the field, he is awakened and both join in shouting and making all the noise they can with sticks and drums.

The food of the Elephant appears to be considerably varied, and chosen by the animal with no small amount of daintiness; sweet-tasting fruits, seeds, and blossoms he has the greatest partiality for, and in their selection much destruction is occasioned by a herd of these huge animals. Tennent says that in Ceylon, where the food of the Elephant is most abundant, the animal never appears to be in a hurry to eat; but amuses himself with playing with the leaves, shaking the trees, tearing the bark, and now and then pausing to eat, altogether taking the whole affair in a very leisurely sort of way. He is especially fond of the fruit of the palmyra palm, and never fails to make his appearance in the districts where these trees grow when the fruit begins to fall to the ground. Although the amount of food consumed by Elephants in their wild state is very large, there is reason to believe that many stories told of their extraordinary eating capabilities are much exaggerated. It by no means follows that because an Elephant in a tame state will eat so much bread, turnips, hay, &c., that it consumes the same quantity of its natural food in a wild state. The Elephants are believed to drink nightly in very hot weather, but in cool weather only every third or fourth day, and for this purpose they travel long distances to their watering-places, even as far as ten or twenty miles, refreshing themselves by a bath and a drink at the same time when they reach their destination.

Various modes are used for catching Elephants; but the usual practice is to drive them into what is termed a keddah. The keddah is a large area surrounded by a broad ditch, and towards the entrance is a similar construction to the main body, but smaller, acting as a sort of funnel, into which the Elephants enter when driven from the jungle, and which assists in getting them into the keddah itself.

On discovering a large herd of Elephants, a body of men, often numbering six or eight thousand, are collected to surround them, carrying all sorts of instruments likely to create a noise, such as firearms, drums, trumpets, &c., Elephants being exceedingly alarmed by any unusual noises. By this means they are gradually driven into the keddah, sometimes from a distance of thirty or forty miles, which frequently occupies some days. When the Elephants find themselves fairly entrapped, they become violent and use their utmost endeavours to break down the barriers.

Formerly, it was the practice to starve these captured Elephants into submission; now, however, by means of two tame ones, trained for the purpose, they can be captured without injury, one by one,

INDIAN ELEPHANT.

and afterwards bound to a tree. To accomplish this the trained animals are sent into the enclosure, and on a wild Elephant being singled out, the two trained ones place themselves one on each side, and attract its attention while the attendants are occupied in binding its legs, which having been satisfactorily accomplished, the captive is dragged to a tree and fastened firmly, where it remains until reduced to submission and obedience by kindness and good feeding.

"The vast jungles in the south-eastern portion of the Mysore territory are infested with herds of wild Elephants, whose depredations on the adjacent lands have retarded agriculture to a serious extent. A project was set on foot by Mr. G. P. Sanderson, a young and energetic officer in the service of the Mysore Government, to convert these Elephants to some use by capturing and taming them. Mr. Sanderson's design was to drive a herd into a strongly embanked channel leading out of the Houhole river, escape being cut off at one end by a deep ditch, and the other opening on the river, guarded by Elephant chains supported by strong posts. On the 9th June, 1874, the Elephants being reported in the neighbourhood, a large party of natives, led by Mr. Sanderson and two other ardent sportsmen, hurried to the spot, and quietly drove the animals towards the channel. The leading Elephant being pushed from behind by his companions, tumbled over the bank, and the latter soon followed. This having been effected, the embankment was quickly strengthened, large fires lighted at intervals along it, and watchers placed for the night. The next point was to move the Elephants into a still smaller enclosure, which was prepared close by. It was funnel-shaped at the mouth, and formed of trunks of trees, firmly fixed in the ground, the snare being disguised by branches and brushwood. Over the neck of the funnel, so to speak, a drop formed of two large cocoa-nut trees lashed together was suspended by a rope, to be severed at a stroke when the Elephants were all in. The herd, terrified by firebrands, rockets, and guns, were driven towards the keddah, and led by a troublesome tusker, who had long kept the others at bay, marched majestically one by one through the gate. After a short pause, owing to a stand being made by a few of the most refractory, the last of the herd went in with a rush, closely followed by a frantic native waving a firebrand. An officer sitting ready on a branch of a tree now cut the rope, and the drop fell amid loud cheers, thus capturing the rich prize of fifty-three Elephants, which were brought out one by one with the assistance of tame Elephants. The latter advance in a body and gradually cut one off from the herd. While amusing it, and distracting its attention, its legs are warily tied by trained men. After this no difficulty is encountered. The capture described included twelve valuable tuskers, and its value was estimated at over £4,000."*

Indian Elephants are also sometimes captured by means of pitfalls formed in a similar manner to those used in Africa. There is, however, one great objection to this mode of capture, which is, that the animal is rendered very liable, from the heavy fall it sustains, of being seriously hurt, and indeed injuries thus received have often proved fatal.

Another way of catching these animals in some districts of India is by means of the lasso. Two trained females are procured for the purpose; these are provided with a long rope which is fastened to their girdle, and then coiled on their backs. Its end forms a noose, which a man, who sits on the back of the trained female, throws round the neck of the wild Elephant; the tame one then walks away until the captured one is almost strangled. In the meantime, the people, assisted by another tame female, endeavour to fasten ropes to his legs, and he is dragged to a place where there are trees, to which he is fastened until he becomes tame. The Elephants caught in this manner are usually small, and the majority, for some reason or other, die, probably from the rough usage they have undergone.

Elephant shooting, especially in Ceylon, was considered to be the acme of sport; but from the number that were wantonly destroyed, an order was issued by the Governor prohibiting their destruction. The Elephant is invaluable as a labourer; its assistance in road-making, bridge-building, ploughing, piling logs, lifting weights, and other similar operations, is of the utmost service. Even as a nurse for young children, its services, we are told, are sometimes required. An Indian officer relates that he has seen the wife of a mahout (for the followers often take their families with them to camp), give a baby in charge of an Elephant, while she went on some business, and has been highly amused in observing the sagacity and care of the unwieldy nurse. The child, which, like most

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* *Graphic*, June 12, 1875.

HERD OF ELEPHANTS, CEYLON.

children, did not like to be at rest in one position, would, as soon as left to itself, begin crawling about, in which exercise it would probably get among the legs of the animal, or entangled in the branches of the trees on which he was feeding, when the Elephant would in the most tender manner disengage his charge, either by lifting it out of the way with his trunk, or by removing the impediments to its free progress. If the child had crawled to such a distance as to verge upon the limits of his range (for the animal was chained by the leg to a peg driven in the ground), he would stretch out his trunk and lift it back as gently as possible to the spot whence it had started.

Endless other stories are told of the sagacity of this noble animal, some of them, however, probably not ungarnished with considerable exaggeration. However, this creature does undoubtedly possess a most wonderful amount of intelligence, and it is believed that the Indian species, both in sagacity and docility, surpasses the African.

The White Elephants, held in reverence in Siam, and extremely rare, are not distinct from the rest; they are merely albinoes, or white varieties, and are to be viewed in the same light as white Blackbirds or white Sparrows.

THE AFRICAN ELEPHANT* is distinguished at once from the Indian species by the great size of its ears, its larger eye, convex forehead, darker colour of its skin, and by possessing only three instead of four nails or hoofs in the hind foot. It is indigenous to Africa, being found south of the Sahara as far as Cape Colony, and from the Indian Ocean to the Atlantic. It formerly lived north of the Sahara, and in the Pleistocene age of geologists was found in Europe, in Italy, and in Spain, to which points it probably crossed at the time when the submerged barriers between Sicily and Africa, and Gibraltar and Africa, were above the level of the water.

Unlike the Indian species, both the males and the females are provided with tusks. The African differs also considerably in his habits, for while the Indian enjoys coolness and shade, the African is more or less exposed to the burning sun.

According to Sir Samuel Baker, "in Africa the country being generally more open than in Ceylon, the Elephant remains throughout the day either beneath a solitary tree, or exposed to the sun in the vast prairies, where the thick grass attains a height of from nine to twelve feet. The general food of the African Elephant consists of the foliage of trees, especially of mimosas. Many of the mimosas are flat-headed, about thirty feet high, and the richer portion of the foliage confined to the crown. Thus, the Elephant, not being able to reach to so great a height, must overturn the tree to procure the coveted food. The destruction caused by a herd of Elephants in a mimosa forest is extraordinary, and I have seen trees uprooted of so large a size that I am convinced no single Elephant could have overturned them. I have measured trees four feet six inches in circumference, and about thirty feet high, uprooted by Elephants. The natives have assured me that they mutually assist each other, and that several engage together in the work of overturning a large tree. None of the mimosas have tap roots; thus the powerful tusks of the Elephants applied as crowbars at the roots, while others pull at the branches with their trunks, will effect the destruction of a tree so large as to appear invulnerable."

The following account by Gordon Cumming, which, on some points as to the habits and haunts of the African Elephant does not agree with that of Sir Samuel Baker, may be explained by the different nature of the country hunted by him:—"The Elephant is widely diffused through the vast forests, and is met with in herds of various numbers. The male is much larger than the female. He is provided with two enormous tusks. These are long, tapering, and beautifully arched; their length averages from six to eight feet, and they weigh from sixty to a hundred pounds each. In the vicinity of the Equator the Elephants attain to a larger size than to the southward; and I am in possession of a pair of tusks of the African bull Elephant, the larger of which measures ten feet nine inches in length, and weighs one hundred and seventy-three pounds.

"Old bull Elephants are found singly or in pairs, or consorting together in small herds, varying from six to twenty individuals. The younger bulls remain for many years in the company of their mothers, and these are met together in large herds of from twenty to a hundred individuals. The food of the Elephant consists of the branches, leaves, and roots of the trees, and also of a variety of bulbs, of the situation of which he is advised by his exquisite sense of smell. To obtain these he turns up the ground with his tusks, and whole acres may be seen thus ploughed up. Elephants consume an

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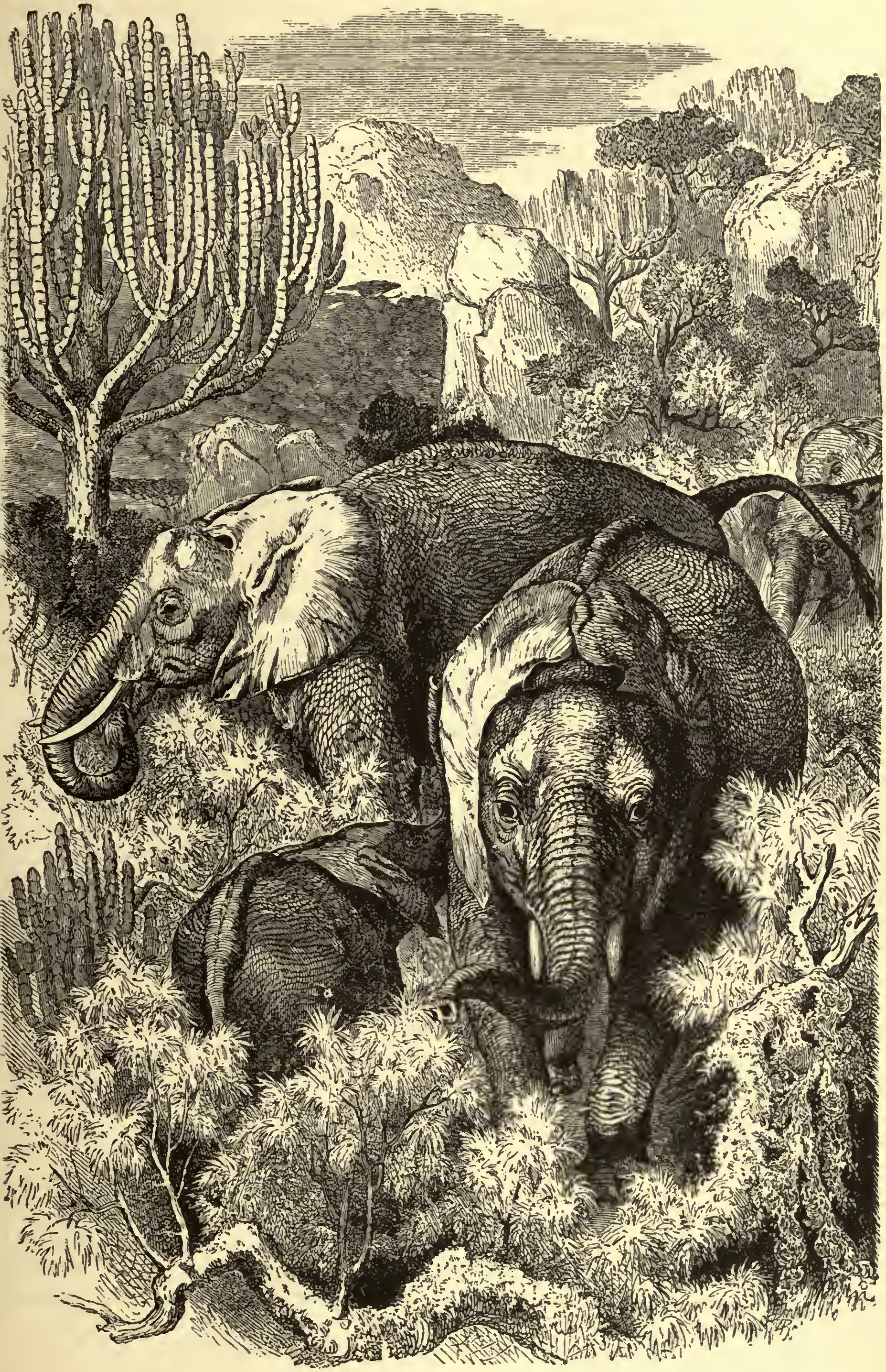
* *Elephas africanus.*



AFRICAN ELEPHANT.

immense quantity of food, and pass the greater part of the day and night in feeding. Like the Whale in the ocean, the Elephant on land is acquainted with, and roams over, wide and extensive tracts. He is extremely particular in always frequenting the freshest and most verdant districts of the forests, and when one district is parched and barren, he will forsake it for years and wander to great distances in quest of better pasture.

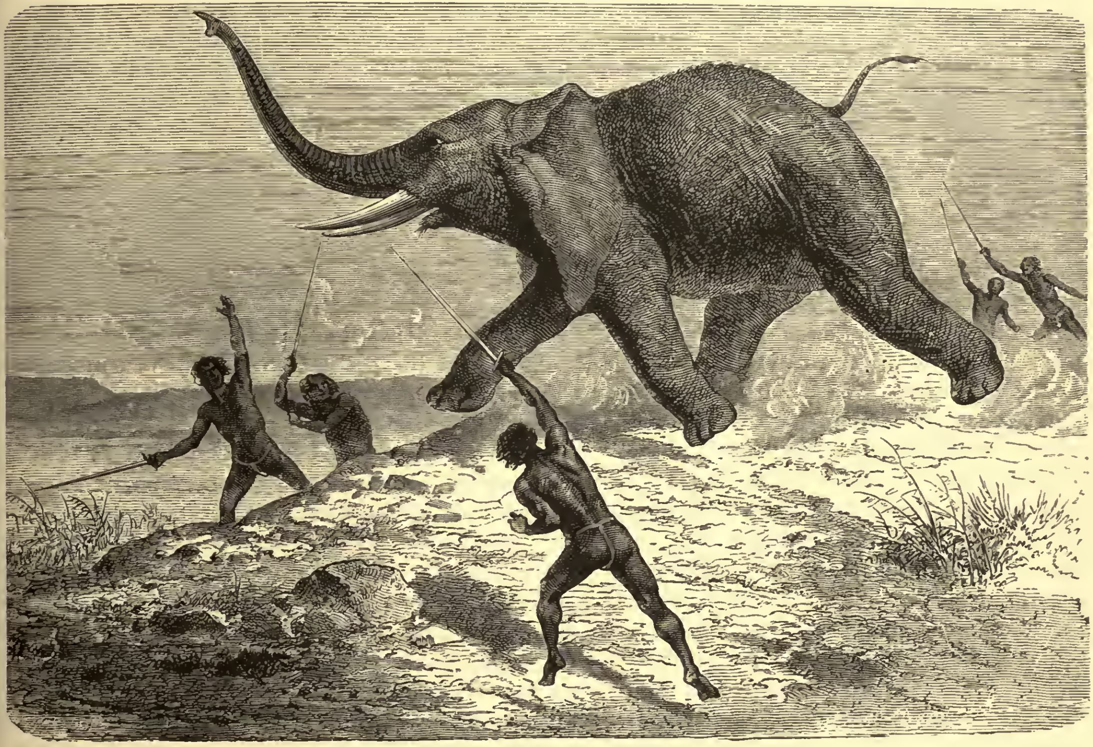
"The Elephant entertains an extraordinary horror of man, and a child can put a hundred of them to flight by passing at a quarter of a mile to windward; and when thus disturbed they go a long way before they halt. It is surprising how soon these sagacious animals are aware of the presence of a hunter in their domains. When one troop has been attacked, all the other Elephants frequenting the district are aware of the fact within two or three days, when they all forsake it, and migrate to distant parts, leaving the hunter no alternative but to inspan his wagons, and remove to fresh ground.

"This constitutes one of the greatest difficulties which a skilful Elephant-hunter encounters. Even in the most remote parts, which may be reckoned the head-quarters of the Elephant, it is only occasionally, and with inconceivable toil and hardship, that the eye of the hunter is cheered by the sight of one. Owing to habits peculiar to himself, the Elephant is more inaccessible and much more rarely seen than any other game quadruped, excepting certain rare Antelopes. They choose for their resort the most lonely and secluded depths of the forest, generally at a very great distance from the rivers and fountains at which they drink. In dry and warm weather they visit these waters nightly; but in cool and cloudy weather they drink only once every third or fourth day. About sundown the Elephant leaves his distant midday haunt, and commences his march towards the fountain, which is probably from twelve to twenty miles distant. This he generally reaches between the hours of nine and midnight, when, having slaked his thirst and cooled his body by spouting large volumes of water over his back with his trunk, he resumes the path to his forest solitudes. Having reached a secluded spot, I have remarked that full-grown bulls lie down on their broadsides about the hour of midnight and sleep for a few hours. The spot which they usually select is an ant-hill, and they lie around it with their backs resting against it. These hills, formed by the white Ants, are from thirty to forty feet in diameter at their base. The mark of the under tusk is always deeply imprinted in the ground, proving that they lie upon their sides. I never remarked that females had thus lain down, and it is only in the more secluded districts that the bulls adopt this practice; for I observed that, in districts where the Elephants were liable to frequent disturbance, they took repose standing on their legs beneath some shady tree. Having slept, they then proceed to feed extensively. Spreading out from one another, and proceeding in a zigzag course, they smash and destroy all the finest trees in the forest which happen to lie in their course. The number of goodly trees which a herd of bull Elephants will thus destroy is utterly incredible. They are extremely capricious, and on coming to a group of five or six trees they break down, not unfrequently, the whole of them, when, having perhaps only tasted one or two small branches, they pass on and continue their wanton work of destruction. I have repeatedly ridden through forests where the trees thus broken down lay so thick across one another that it was almost impossible to ride through the district; and it is in situations such as these that attacking the Elephant is attended with most danger. During the night they will feed in open plains and thickly-wooded districts, but as day dawns, they retire to the densest covers within reach, which nine times in ten are composed of the impracticable wait-a-bit thorns; and here they remain drawn up in a compact herd during the heat of the day. In remote districts, however, and in cool weather, I have known herds to continue pasturing throughout the whole day."

The African Elephant is not now hunted for domestic purposes, but for the sake of the flesh and of the ivory; and its death is a grand affair for the natives, since it affords opportunity not merely for a feast, but for obtaining fat for internal and external uses. There are various methods of killing them. Pitfalls are most common, and are generally placed in the neighbourhood of a drinking-place, the natives showing great skill in felling trees, so as to turn the Elephants into them. According to Sir Samuel Baker, "the pits are usually about twelve feet long, and three feet broad, by nine deep; these are artfully made, decreasing towards the bottom to the breadth of a foot. The general Elephant route to the drinking-places being blocked up, the animals are diverted by a treacherous path towards the water, the route intersected by numerous pits, all of which are carefully concealed by sticks and straw, the latter being usually strewn with Elephants' dung, to create a natural effect.

Should an Elephant during the night fall through the deceitful surface, his foot becomes jammed in the bottom of the narrow grave, and he labours shoulder-deep, with two feet in the pitfall so fixed that extrication is impossible. Should one animal be thus caught, a sudden panic seizes the rest of the herd, and in their hasty retreat one or more are generally victims to the numerous pits in the vicinity. Once helpless in the pit, they are easily killed with lances."

The same author also relates that sometimes the Elephant-hunters, or aggageers, of the Hamram tribe, use swords for killing Elephants. They follow the tracks of the animal, "so as to arrive at their game between the hours of 10 and 12 A.M., at which time it is either asleep or extremely listless, and easy to approach. Should they discover the animal asleep, one of the hunters would creep stealthily towards the head, and with one blow sever the trunk while stretched upon the ground; in which case the Elephant would start upon his feet, while the hunters escaped in the confusion of the moment. The trunk severed would cause a loss of blood sufficient to insure the death of the Elephant within about an hour. On the other hand, should the animal be awake upon their arrival, it would be impossible to approach the trunk. In such a case, they would creep up from behind, and give a tremendous cut at the back sinew of the hind leg, about a foot above the heel. Such a blow would disable the Elephant at once, and would render comparatively easy a second cut to the remaining leg. These were the methods adopted by poor hunters, until by the sale of ivory they could purchase Horses for the higher branch of the art. Provided with Horses, the party of hunters should not exceed four. They start before daybreak, and ride slowly throughout the country in search of Elephants, generally keeping along the course of a river until they come upon the tracks where a herd, or a single Elephant, may have drunk during the night. When once upon the track, they follow fast towards the retreating game. The Elephants may be twenty miles distant, but it matters little to the aggageers. At length they discover them, and the hunt begins. The first step is to single out the bull with the largest tusks; this is the commencement of the fight. After a short hunt, the Elephant turns upon his



AGGAGEERS HUNTING AN ELEPHANT.

pursuers, who scatter and fly from his headlong charge until he gives up the pursuit; he at length turns to bay when again pressed by the hunters. It is the duty of one man in particular to ride up close to the head of the Elephant, and thus to absorb its attention upon himself. This insures a desperate charge. The greatest coolness and dexterity are then required by the hunter, who, now the *hunted*, must so adapt the speed of his Horse to the pace of the Elephant that the enraged beast gains in the race, until it almost reaches the tail of the Horse. In this manner the race continues. In the meantime, two hunters gallop up behind the Elephant, unseen by the animal, whose attention is completely directed to the Horse almost within his grasp. With extreme agility, when close to the heels of the Elephant, one of the hunters, while at full speed, springs to the ground with his drawn sword, as his companion seizes the bridle, and with one dexterous two-handed blow he severs the back sinew. He immediately jumps out of the way, and remounts his Horse; but if the blow is successful, the Elephant is hamstrung, and, as it cannot run rapidly on three legs, is easily killed."

The Fans in the neighbourhood of the Gaboon settlements, according to Mr. Winwood Reade, are in the habit of employing the same mode of capturing Elephants as the natives of India, namely, by enticing them within an enclosure or fence of posts and rails, where they are afterwards killed with cross-bows, spears, and trade-guns.

Elephant-shooting, although not unattended by danger, appears to be on the whole accomplished with considerable success, five or six Elephants having been killed occasionally in a very short space of time by one man; and many are the tales of hair-breadth escapes related to us by Gordon Cumming, Tennent, Baker, and others. But it appears the forehead-shot, so much in favour in shooting Indian Elephants, does not answer with the African species, the form of the head and the position of the tusks preventing the bullet from reaching the brain.

"The only successful forehead-shot," says Sir S. Baker, "that I made at an African Elephant was shortly after my arrival in the Abyssinian territory, on the Settite River; this was in thick, thorny jungle, and an Elephant from the herd charged with such good intention that, had she not been stopped, she must have caught one of the party. When within about five yards of the muzzle of my rifle, I killed her dead by a forehead-shot with a hardened bullet, and we subsequently recovered the bullet in the *vertebræ of the neck!* This extraordinary penetration led me to suppose that I should always succeed as I had done in Ceylon, and I have frequently stood the charge of an African Elephant until close upon me, determined to give the forehead-shot a fair trial, but I have *always* failed, except in the instance now mentioned. It must be borne in mind that the Elephant was a female, with a head far inferior in size and solidity to that of the male. The temple-shot, and that behind the ear, are equally fatal in Africa as in Ceylon, provided the hunter can approach within ten or twelve yards; but altogether the hunting is far more difficult, as the character of the country does not admit of an approach sufficiently close to guarantee a successful shot. In the forests of Ceylon, an Elephant can be stalked to within a few paces, and the shot is seldom fired at a greater distance than ten yards. Thus accuracy of aim is insured; but in the open ground of Africa an Elephant can seldom be approached within fifty yards, and should he charge the hunter escape is most difficult. I never found African Elephants in good jungle, except once, and on that occasion I shot five quite as quickly as we should kill them in Ceylon."

Gordon Cumming gives us the following information as to how the natives cut up an Elephant for food and other purposes. "The rough outer skin is first removed, in large sheets, from the side which lies uppermost. Several coats of an under skin are then met with. This skin is of a tough and pliant nature, and is used by the natives for making water-bags, in which they convey supplies of water from the nearest 'vley,' or fountain (which is often ten miles distant), to the Elephants. They remove this inner skin with caution, taking care not to cut it with the assegai; and it is formed into water-bags by gathering the corners and edges, and transfixing the whole on a pointed wand. The flesh is then removed in enormous sheets from the ribs, when the hatchets come into play, with which they chop through, and remove individually, each colossal rib. The bowels are thus laid bare; and in the removal of these the leading men take a lively interest and active part, for it is throughout and around the intestines that the fat of the Elephant is mainly found.

"There are few things which a Bechuana prizes so highly as fat of any description. They will go an amazing distance for a small portion of it. They use it principally in cooking their sun-dried biltong, and they also eat it with their corn. The fat of the Elephant lies in extensive layers and sheets in his inside, and the quantity which is obtained from a full-grown bull, in high condition, is very great. Before it can be obtained, the greater part of the intestines must be removed. To accomplish this, several men eventually enter the immense cavity of his inside, where they continue mining away with their assegais, and handing the fat to their comrades outside until all is bare. While this is transpiring with the sides and intestines, other parties are equally active in removing the skin and flesh from the remaining parts of the carcass.

"The natives have a horrid practice on these occasions of besmearing their bodies, from the crown of the head to the sole of the foot, with the black and clotted gore; and in this anointing they assist one another, each man taking up the fill of both his hands, and spreading it over the back and shoulders of his friend. Throughout the entire proceeding, an incessant and deafening clamour of many voices and confused sounds is maintained, and violent jostling and wrestling are practised by every man, elbowing the breasts and faces of his fellows, all slippery with gore, as he endeavours to force his way to the flesh through the dense intervening ranks, while the sharp and ready assegai gleams in every hand. The angry voices and gory appearances of these naked savages, combined with their excited and frantic gestures and glistening arms, presented an effect so wild and striking that, when I first beheld the scene, I contemplated it in the momentary expectation of beholding one-half of the gathering turn their weapons against the other.

"The trunk and feet of the Elephant are considered a great delicacy, and are baked in holes in the earth, which have been heated by fires burnt in them. The flesh of the Elephant is then cut into strips, varying from six to twenty feet, and about two inches in breadth and thickness. It is then placed on poles, and allowed to dry in the sun for two or three days, after which it is packed into bundles, each man carrying off his share to his wife and family."

FOSSIL ELEPHANTS AND THEIR ALLIES.

The Proboscidea, represented, as we have already seen, by two species only among living animals, both of which are met with in and near the tropical regions of the Old World, in the fossil state are met with over nearly the whole of the Old World, and of the New; and are divided into three genera—Elephas, Mastodon, and Dinotherium.

The teeth and bones of these creatures found in Europe were assigned in the sixteenth, seventeenth, and eighteenth centuries to giants, and many are the stories which were commonly reported about them —as, for example, that of the giant of Dauphiné, in the reign of Louis XIV. His remains were discovered by a surgeon, who stated that they were enclosed in an enormous sepulchre covered with a stone slab, bearing the inscription *Teutobochus rex;* and that in the vicinity there were also found coins or medals, all of which showed the remains to be those of a giant king of the Cimbri, who fought against Marius. However, the original owner of these bones, though not of the coins, was proved to have been an Elephant.

The story of Teutobochus is even excelled by that of another giant, called the giant of Lucerne, whose remains when dug up were examined by a celebrated Professor of Basle, who described them as of human origin, and was skilful enough to put them together so as to resemble a giant no less than twenty-six feet high. For some time the deluded people of Lucerne paid homage to this Elephantine prodigy, until the scales were removed from their eyes by Blumenbach, who pronounced to their astonished senses that the giant, as it lay in state at the Jesuits' College, was but the skeleton of an Elephant.

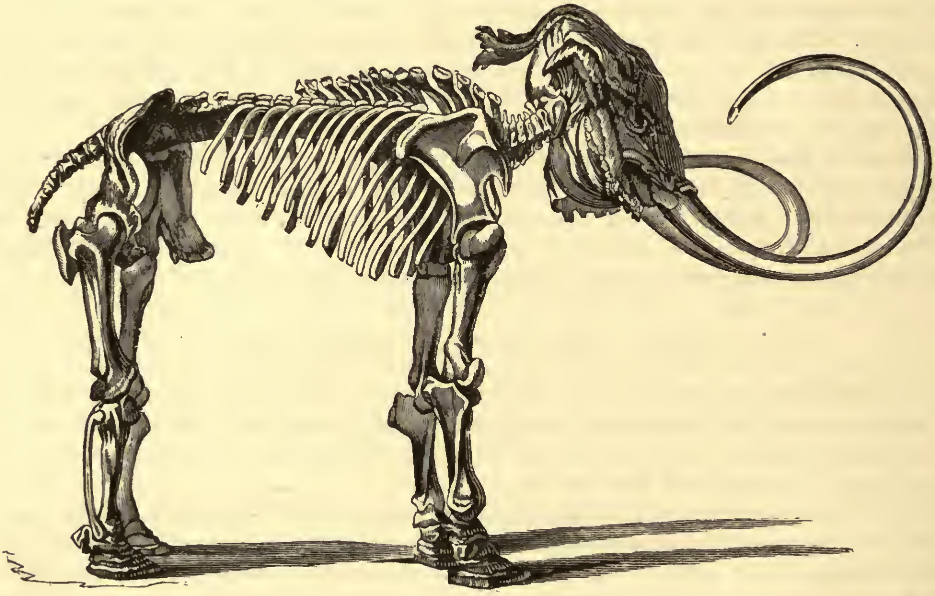
The Tertiary or third great period into which the geologists divide the life-history of the earth consists of the following divisions:—Eocene, Miocene, Pliocene, Pleistocene, Prehistoric, and Historic, and it is in the Pliocene stage that the Elephant first appears in Europe and America.

The large, straight-tusked Elephant (*E. meridionalis*), with large grinders composed of thick and coarse plates, is found ranged over the whole of France, Italy, Britain, and Germany in those times, in company with another narrow-toothed species, also with straight tusks, described by Dr. Falconer under the name of *Elephas antiquus.*

By far the best known and most important of these huge creatures is the far-famed MAMMOTH

(*Elephas primigenius*). This Elephant has been found frozen in Siberian soil beautifully preserved, with the hair and tissues in so good a condition that microscopical sections have been made of them.

The story of finding the first Mammoth imbedded in ice has been often told, but is still of sufficient interest to be related again. A Tungoosian fisherman, named Schumachoff, about the year 1799, was proceeding, as is the custom of fishermen in those parts when fishing proves a failure, along the shores of the Lena in quest of Mammoth tusks, which have been there found in considerable abundance. During his rambles, having gone farther than he had done before, he suddenly came face to face with a huge Mammoth imbedded in clear ice. This extraordinary sight seems to have filled him with astonishment and awe; for instead of at once profiting by the fortunate discovery, he allowed several years to roll on before he summoned courage to approach it closely, although it was his habit to make stealthy journeys occasionally to the object of his wonder. At length, seeing, it is presumed, the terrific monster made no signs of eating him up, and that its tusks would bring him a considerable sum of money, he allowed the hope of gain to overcome his superstitious scruples. He boldly broke the barrier of ice, chopped off the tusks, and left the carcass to the mercy of the Wolves and Bears, who, finding it palatable, soon reduced the huge creature to a skeleton. Some two years afterwards a man of science was on the scent, and although so late in at the death, found a huge skeleton with three legs, the eyes still in the orbits, and the brain uninjured in the skull.



SKELETON OF MAMMOTH.

In addition to the peculiarity of the Mammoth having its body covered with long woolly hair, it was also remarkable for the extraordinary formation of its enormous tusks, which curved upwards, forming a spiral.

The eminent Siberian explorer, Dr. Middendorf, in 1843, met with a second instance of the Mammoth being preserved to such a degree that the bulb of the eye is now in the same museum as the skeleton of a Mammoth found by Mr. Adams in 1803. Middendorf found it in latitude 66° 30 N., between the Obi and the Yenisei near the Arctic Circle. In the same year he also found a young animal of the same species in beds of sand and gravel, at about fifteen feet above the level of the sea, near the river Taimyr, in latitude 75° 15′, associated with marine shells of living Arctic species, as well as with the trunk of the larch. But the fourth, and by far the most important, discovery of a Mammoth is described by an eye-witness of its unearthing, and the record is so valuable in its bearings that we give it at some length. A young Russian engineer, Benkendorf by name, employed by the Government in a survey of the coast of the mouth of the Lena and Indighirka, was despatched up the latter stream, in 1846, in command of a small iron steam-cutter. He writes the following account, which we translate, to a friend in Germany :—

"In 1846 there was uncommon warm weather in the north of Siberia. Already in May unusual rains poured over the moors and bogs, storms shook the earth, and the streams carried not only ice to the sea, but also large tracts of land, thawed by the masses of warm water fed by the southern rains. . . . We steamed on the first favourable day up the Indighirka; but there were no thoughts of land. We saw around us only a sea of dirty brown water, and knew the river only by the rushing and roaring of the stream. The river rolled against us trees, moss, and large masses of peat, so that it was only with great trouble and danger we could proceed. At the end of the second day, we were only about forty versts [one verst = 1,166½ yards English] up the stream. Some one had to stand with the sounding-rod in hand continually, and the boat received so many shocks that it shuddered to the keel. A wooden vessel would have been smashed. Around us we saw nothing but the flooded land. For eight days we met with the like hindrances, until at last we reached the place where our Yakuts were to have met us. Farther up was a place called Ujandina, whence the people were to have come to us, but they were not there, prevented evidently by the floods. As we had been here in former years we knew the place. But how it had changed! The Indighirka, here about three versts wide, had torn up the land and worn itself a fresh channel, and when the waters sank we saw to our astonishment that the old river-bed had become merely that of an insignificant stream. This allowed me to cut through the soft earth, and we went reconnoitring up the new stream which had worn its way westwards. Afterwards we landed on the new shore, and surveyed the undermining and destructive operation of the wild waters, that carried away with extraordinary rapidity masses of soft peat and loam. It was then that we made a wonderful discovery. The land on which we were treading was moorland, covered thickly with young plants. Many lovely flowers rejoiced the eye in the warm beams of the sun, that shone for twenty-two out of the twenty-four hours. The stream rolled over and tore up the soft wet ground like chaff, so that it was dangerous to go near the brink. While we were all quiet, we suddenly heard under our feet a sudden gurgling and stirring, which betrayed the working of the disturbed water. Suddenly our jäger [hunter], ever on the look-out, called loudly, and pointed to a singular and unshapely object, which rose and sank through the disturbed waters. I had already remarked it, but not given it my attention, considering it only drift wood. Now we all hastened to the spot on the shore, had the boat drawn near, and waited until the mysterious thing should again show itself. Our patience was tried, but at last, a black, horrible, giant-like mass was thrust out of the water, and we beheld a colossal Elephant's head, armed with mighty tusks, with its long trunk moving in the water, in an unearthly manner, as though seeking for something lost therein. Breathless with astonishment, I beheld the monster hardly twelve feet from me, with his half-open eyes yet showing the whites. It was still in good preservation.

"'A Mammoth! a Mammoth!' broke out the Tschermomori, and I shouted 'Here quickly! chains and ropes!' I will pass over our preparations for securing the giant animal, whose body the water was trying to bear from us. As the animal again sank we waited for an opportunity to throw the ropes over his neck. This was only accomplished after many efforts. For the rest we had no cause for anxiety, for after examining the ground I satisfied myself that the hind legs of the Mammoth still stuck in the earth, and that the water would work for us to unloosen them. We therefore fastened a rope round his neck, threw a chain round his tusks, that were eight feet long, drove a stake into the ground about twenty feet from the shore, and made chain and rope fast to it. The day went by quicker than I thought for, but still the time seemed long before the animal was secured, as it was only after the lapse of twenty-four hours that the waters had loosened it. But the position of the animal was interesting to me; it was standing in the earth, and not lying on its side or back as a dead animal naturally would, indicating by this the manner of its destruction. The soft peat or marsh land on which he stepped thousands of years ago gave way by the weight of the giant, and he sank as he stood on it feet foremost, incapable of saving himself, and a severe frost came and turned him into ice, as well as the moor which had buried him; the latter, however, grew and flourished, every summer renewing itself; possibly the neighbouring stream had heaped plants and sand over the dead body.

God only knows what causes had worked for its preservation; now, however, the stream had once more brought it to the light of day, and I, an ephemera of life compared with this primeval giant, was sent here by heaven just at the right time to welcome him. You can imagine how I jumped for joy. . . . . Picture to yourself an Elephant with a body covered with thick fur, about thirteen feet in height, and fifteen in length, with tusks eight feet long, thick and curving outwards at their ends, a stout trunk of six feet in length, colossal limbs of one foot and a half in thickness, and a tail naked up to the end, which was covered with thick tufty hair. The animal was fat and well grown; death had overtaken him in the fulness of his powers. His parchment-like, large, naked ears lay fearfully turned up over the head; about the shoulders and the back he had stiff hair, about a foot in length, like a mane. The long outer hair was deep brown and coarsely rooted. The top of the head looked so wild, and was so penetrated with pitch, that it resembled the rind of an old oak-tree. On the sides it was cleaner, and under the outer hair there appeared everywhere a wool, very soft, warm, and thick, and of a yellow brown colour. The giant was well protected against the cold. The whole appearance of the animal was fearfully wild and strange. It had not the shape of our present Elephants. As compared with our Indian Elephants, its head was rough, the brain case low and narrow, but the trunk and mouth were much larger. The teeth were very powerful. Our Elephant is an awkward animal, but compared with this Mammoth it is as an Arabian steed to a coarse ugly Dray-horse. I could not divest myself of a feeling of fear as I approached the head; the broken, widely-opened eyes gave the animal an appearance of life, as though it might move in a moment and destroy us with a roar. . ; . . . . . The bad smell of the body warned us that it was time to save of it what we could, and the swelling flood, too, bade us hasten. First of all we cut off the tusks, and sent them to the cutter. Then the people tried to hew the head off, but, notwithstanding their good will, this was slow work. As the belly of the animal was cut open the intestines rolled out, and then the smell was so dreadful that I could not overcome my nauseousness, and was obliged to turn away. But I had the stomach separated and brought on one side. It was well filled, and the contents instructive and well preserved. The principal were young shoots of the fir and pine; a quantity of young fir cones also, in a chewed state, were mixed with the mass."

This most graphic account affords a key for the solution of several problems hitherto unknown. It is clear that the animal must have been buried where it died, and that it was not transported from any place farther up stream to the south, where the climate is comparatively temperate. The presence of fir-spikes in the stomach proves that it fed on the vegetation which is now found at the northern part of the woods, as they join the low, desolate, treeless, moss-covered tundra, in which the body lay buried, a fact that would necessarily involve the conclusion that the climate of Siberia, in those ancient days, differed but slightly from that of the present time. Before this discovery, the food of the Mammoth had not been known by direct evidence. The circumstances under which it was brought to light enable us to see how animal remains could be entombed in the frozen soil without undergoing decomposition, which Baron Cuvier and Dr. Buckland agreed in accounting for by a sudden cataclysm, and Sir Charles Lyell by the hypothesis of their having been swept down by floods from the temperate into the arctic zone. In this particular case, the marsh must have been sufficiently soft to admit of the Mammoth sinking in; while shortly after death the temperature must have been lowered, so as to arrest decomposition, up to the very day on which the body arose under the eyes of M. Benkendorf, in the exceptionally warm year of 1846, when the tundra was thawed to a most unusual depth, and converted into a morass permeable by water. Had any Mammoths been alive in that year, and had they strayed beyond the limits of the woods into the tundra, some would in all human probability have been engulfed; and, when once covered up, the normal cold of winter would suffice to prevent the thaw of the carcases, except in extraordinary seasons, such as that in which this one was discovered. Probably many such warm summers intervened since its death, but as it was preserved from the air, they would not accelerate putrefaction to any great degree. In this way the problem of its entombment and preservation may be solved by an appeal to the present climatal conditions of Siberia. The difficulty of accounting for such vast quantities of remains in the Arctic Ocean, especially in the Läckhow Islands off the mouth of the Lena, is also explained by this discovery, as well as the association of marine shells with the remains of the Mammoth. The body was swept away by the swollen flood of the Indighirka, along with many other waifs and strays, and no doubt by this time is adding to the vast accumulation in the Arctic Sea. It was seen by a mere chance, and must be viewed as an example of the method by which animal remains are swept seaward. In all probability, the frozen morass in which it was discovered is as full of Mammoths as the peat-bogs of Ireland are of Irish Elk, and have been the main source from which the Arctic rivers have obtained their supply of animal remains. The remains of the Mammoth are met with in incredible numbers in the river deposits of Middle and Northern Europe, as well as in those of North America, showing that in ancient times the animal ranged over a tract of land extending from the Mediterranean to the Arctic Sea, and from Behring Strait to the Gulf of Mexico. It is also met with in the caves in Middle Europe, having been dragged into them by the Hyænas, or having fallen a prey to the ancient hunter. We owe, indeed, to the skill of the latter an incisive sketch of the animal as he appeared to the inhabitants of Auvergne, in the remote geological period known as Pleistocene; the long, hairy mane, and spirally-curved tusks, are faithfully depicted by the artist, and, were it not for the strange chance which has preserved to us the whole animal in the frozen ice-cliffs of Siberia, would have seemed to us merely imaginative details. In another example, also from the caves of Auvergne, the Mammoth is represented with his mouth open, and his trunk lifted up in the attitude of charging.

MAMMOTH (*Restored*).

Remains of other extinct species of Elephants are found; one, which is of exceedingly small stature, standing not much higher than from two and a half to three feet, has been discovered in the bone-caves of Malta. The genus MASTODON, which in many respects resembles the true Elephants, differs from them in the formation of the teeth, the grinders being much simpler, more tubercular, and with crowns free from cement. In most cases, also, there were two small tusks in the lower jaw, as well as those in the upper. In Europe they appear in the Miocene and Pliocene strata, and in America they survived into the Pleistocene. The most extraordinary-looking, perhaps, of the fossil Proboscidea, and that furthest removed from the living Elephants, is the DINOTHERIUM, of the Miocene age. It possessed no tusks in the upper jaw, but its lower jaw was armed with two long curved tusks, projecting downwards. It probably possessed the habits of the Elephant, and these tusks may have been used for uprooting trees, or hooking down boughs, so as to obtain the leaves and shoots for food.

W. BOYD DAWKINS.
H. W. OAKLEY.

ORDER HYRACOIDEA (CONIES).

What is the Coney?—Mention in the Bible—General Appearance—Real Place—Range—Varieties—Coney of the Bible—Cape Coney—Ashkoko of Abyssinia—Mr. Winwood Reade's Account of the Habits of the Cape Coney—Skull, Dentition, Ribs, &c.

THE order of animals known to naturalists as Hyracoidea (derived from the Greek ὕραξ, a Shrew, and εἶδος, form) contains but one genus, called Hyrax. Belonging to this genus are but two or three species of small animals, which, however, are of considerable interest, both from their peculiar organisation, and from their mention four times in the Bible under the name of Shaphan, improperly translated Coney, which has given rise to considerable controversy, as to what animal was meant. Some persons considered, and naturally enough, that Coney meant nothing more or less than the Rabbit; but now no doubt exists, as has been shown from its characters and habits, that the animal referred to is the Daman, or *Hyrax syriacus.*

The following are the passages literally rendered, in which the Hyrax is mentioned in the Bible: "Likewise the Coney, because he cheweth the cud, and divideth not the hoof; he shall be unclean unto you" (Leviticus xi. 5). "But these ye shall not eat of them that chew the cud, and of them that divide and cleave the hoof only; the Camel, nor the Hare, nor the Coney; for they chew the cud, but divide not the hoof; therefore they shall be unclean unto you" (Deuteronomy xiv. 7). "The high mountains are for the Goats; the rocks are a refuge for the Conies" (Psalms civ. 18). "The Conies are but a feeble folk, yet make they their houses in the rocks" (Proverbs xxx. 26). With regard to the first passage, although the Hyrax certainly does not chew the cud, the peculiar way in which it moves its jaws, as it sits perched in a ruminating manner, so to speak, on some ledge of rock, would naturally suggest to the ignorant that it really was chewing the cud. In the third quotation, we read "the rocks are a refuge for the Conies." This exactly suits the Hyrax, which is always found inhabiting rocky situations. The last extract also agrees with the known habits of the Hyrax. Here it is alluded to as being one of the four animals on earth who are small, but very wise. These four are the Ant, the Locust, the Spider, and the Coney. All travellers who have noticed the Hyrax are agreed that it is a most wary and crafty animal, and that the utmost caution is required even to obtain a view of it; and to kill one requires a most skilful and practised sportsman.

The Hyrax is a little animal clothed with a brownish fur, of about the size of an ordinary Rabbit, to which, indeed, it has some resemblance. It is allied to the Rhinoceros, the Tapir, and Rodents; but the whole form of the skeleton approaches more nearly to that of the two former than it does to any known species of the latter. Linnæus, however, and other authors, classed it with the Rodents; but Cuvier, seeing that it more nearly approached the characters of the old group of animals called Pachydermata (thick-skinned animals), placed it with them. Now, however, it is assigned by Prof. Huxley to an order of its own named Hyracoidea; but it still is a doubtful question as to what should be done with it.

Of the several animals forming the genus, one, the *Hyrax syriacus*, the Coney of the Bible, is found from the coast of the Red Sea northwards through Syria, by Lebanon, and southwards into Arabia and Ethiopia. Another species, *Hyrax capensis*, the Cape Coney, is found at the Cape and east coast of Africa, extending from Abyssinia down the east coast southwards. Two other species are described from West Africa; but both probably belong to one genus.

Bruce, in his "Travels in Abyssinia," tells us that the Ashkoko, which is understood to be the same as the Daman (*Hyrax syriacus*), is found in Ethiopia, in the caverns of the rocks, and under the large stones in the Mountain of the Sun, behind the queen's palace at Koscam. He also informs us that it is of common occurrence in many other rocky places of Abyssinia, and he says that it does not make holes like Rabbits or Rats, because its toes are not adapted for so doing, and that it is a very timid and gentle creature, stealing along a few paces, and then stopping, as if to see that the coast is clear.

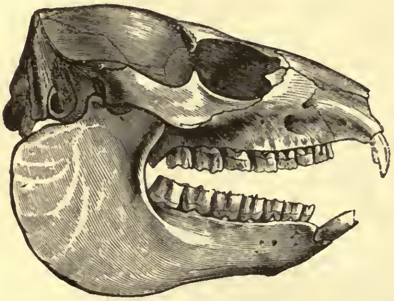
Bruce also states that apparently the same species inhabits Mount Libanus, and the rocks of Cape Mohammed, which divides the Elanitic from the Heroopolitic Gulf, or Gulf of Suez from that of Akabah, and that the only difference he saw was in the greater size and fatness of those of the Mountain of the Sun.

"The *Hyrax capensis*," writes Mr. Reade, "is found living at the Cape of Good Hope, inhabiting

CONIES.

the hollows and caves of the rocks, both on the hill-sides and on the sea shore, a little above high-water mark. It seems to live in families, and in its wild state is remarkably shy. In the cold weather it is fond of coming out of its hole and warming itself in the sun on the side of a rock, and in summer it enjoys the breeze on the top of the hills, but in both instances, as well as when it feeds, a sentinel is always placed on the look-out, generally an old male, which gives notice of any approach of danger by a long shrill cry.

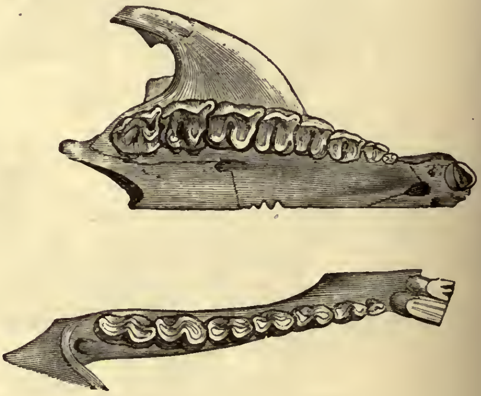
"Its principal food is the young tops of shrubs, especially those which are aromatic, but it also eats herbs, grass, and the tops of flowers. To eat it tastes much like a Rabbit. It is recorded that one gentleman caught two young ones which he kept for some time. They became very tame, and as they were allowed the run of the house would follow him about, jump on to his lap, or creep into his bed for the sake of the warmth. One brought home by Mr. Hennah would also run inquisitively about the cabins, climbing up and examining every person and thing, but startled by any noise, it would run away and hide itself. When shut up for long, it became savage and snarled and tried to bite at everything that came in its way. This animal, both when wild as well as when tame, is very cleanly in its habits. From its faintly crying in its sleep it may be supposed that it dreams. It has also been heard to chew its food at night. When tame it will eat a variety of things, the leaves of plants, bruised Indian corn, raw potatoes, bread, and onions, and will greedily lick up salt. The one brought home by Mr. Hennah was very sensible of the cold, for when a candle was placed near its cage, it would come as close as possible to the bars, and sit still to receive as much warmth as it could. I am inclined to think that the female does not produce more than two young ones at a time, from having observed in several instances but two following the old ones. Its name at the Cape is the Dasse, which is, I believe, the Dutch for a Badger."



SKULL OF CONEY.

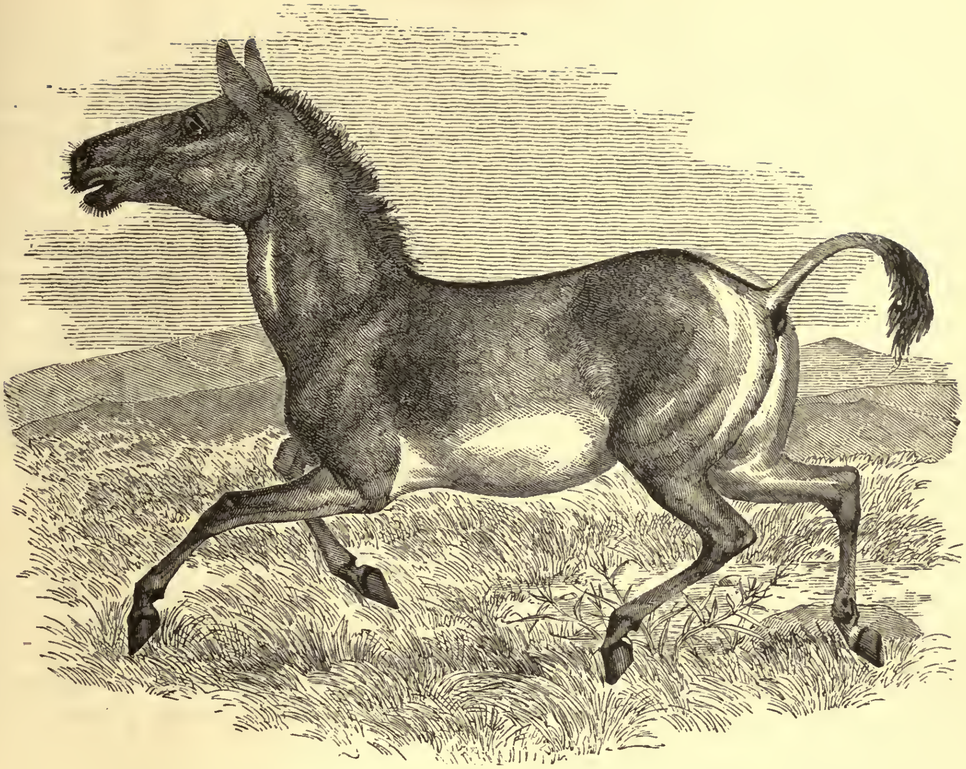
In structure, the skull of the Hyrax approaches more nearly to that of the Ungulata (animals with hoofs), especially to that of the Rhinoceros, than it does to that of any of the Rodents. The nose of the Hyrax, however, not having any horn to support, the nasal bones are not thickened, as they are in the Rhinoceros. There is a marked distinction between the maxillary, or upper jaw-bones of the Hyrax and those of the Rodents, the extent of the former being much smaller. In the former, also, there are two parietal bones, as compared with one in the latter. The joint, or condyle of the lower jaw, differs from that of the Rodents, in which it is compressed longitudinally, while in the Hyrax it is compressed transversely, as in the Ungulata, being also applied to a plane surface of the temporal bone, whereby a motion more or less horizontal is permitted. The Hyrax has no canine teeth. The upper incisors resemble those of Rabbits and Hares in number, which are four in the adult, and those of Rodents generally in the possession of persistent pulps. In shape they approach more to the form of the canines of the Hippopotamus by terminating in a point. The number of lower incisors is also four, and they are procumbent somewhat like those of the Hog. The grinders, both in number and form, resemble those of the Rhinoceros.

With regard to the number of ribs, the Hyrax approaches nearer to the Ungulata and Proboscidea than it does to the Rodents. It departs from the former in the number of the vertebræ and form of the pelvis; but again approaches them in the form of the femora (thigh bones), and also in the formation of the feet; the toes are four in front and three behind, as in the Tapir, and they are supplied with hoofs, or rounded hoof-like nails. They are without collar-bones (clavicles). The body of the Hyrax is covered with thick hair, which is here and there beset with bristles, and the tail is represented by a mere tubercle. No remains of the Hyrax have yet been found in a fossil state.



DENTITION OF CONEY.

W. Boyd Dawkins.
H. W. Oakley.



KIANG, OR WILD ASS OF TIBET.

ORDER UNGULATA (HOOFED QUADRUPEDS).

CHAPTER I.

PERISSODACTYLA—THE EQUIDÆ, OR HORSE FAMILY.

Order *UNGULATA* — Divisions — PERISSODACTYLA — Characteristics—Equidæ — Species — Descent — First Domestic Horses in Europe—Used for Food—Mention of the Horse in the Bible—War-Chariots—the Horse among the Greeks and Romans—in Britain—Attempts to Improve the Breed—Colour—Teeth—"The Mark"—the Foot—Skull—Disease from the Gad-fly—Race-Horse—Trotting-Horse of America—Dray Horse—Shetland Pony—Arab and Barb—Persian Horse—Wild Horses in America—Habits—Byron's "Mazeppa"—Capture and Breaking in—Wild Horses in Australia—The Ass—Species—Stripes—Characteristics — Mule and Hinny—Wild Ass of Tibet—Onager—Wild Ass of Abyssinia—Zebras—Burchell's Zebra—Quagga—Fossil Equidæ—Distribution—Hipparion.

The hoofed quadrupeds are so called because they possess hoofs, from which fact the order Ungulata takes its name,* and they include animals of widely different appearance, such as the Horse, Rhinoceros, Giraffe, Camel, and the like. They are classified into two sub-orders, according to the odd or even number of toes, those having an odd number on the hind foot being termed the Perissodactyla,† such as the Horse, Tapir, and Rhinoceros; and the Artiodactyla,‡ or animals with an even number of toes on their hind feet, such as the Pig, Hippopotamus, Sheep, Ox, Deer, and the like. All the animals belonging to the order feed upon vegetables, with the exception of the Pig and Peccary, which are omnivorous; and none of them are provided with sharp-edged cutting back teeth, adapted for dividing flesh, such as are found in the Carnivora—Lions, Tigers, Wolves, and Hyænas. The odd-toed Ungulates come first.

SUB-ORDER PERISSODACTYLA.

The odd-toed animals consist of three living families—(1) The Equidæ, or Horses; (2) the Tapiridæ, or Tapirs; (3) the Rhinocerotidæ, or Rhinoceroses; and two extinct families—(1) the Palæotheridæ, or Palæotheres (*παλαιός*, old; *θηρίον*, beast); and (2) the Macraucheniadæ (*μακρός*, long; *αὐχήν*, neck). In all the animals belonging to the group, the number of dorso-lumbar vertebræ is not fewer than twenty-two, the third or middle digit of each foot is symmetrical, the femur or thigh-bone has a third trochanter, or knob of bone on the outer side, and the two facets on the front of the astragalus or ankle-bone are very unequal. When the head is provided with horns, they are skin-deep only, without a core of bone, and they are always placed in the middle line of the skull, as in the Rhinoceros.

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* From the Latin *unguis*, *ungula*, a hoof.

† περισσός, uneven; δάκτυλος, toe.

‡ ἄρτιος, even; δάκτυλος, toe.

In the Perissodactyla the number of toes is reduced to a minimum. Supposing, for example, we compare the foot of a Horse with one of our own hands, we shall see that those parts which correspond with the thumb and little finger are altogether absent, while that which corresponds with the middle finger is largely developed, and with its hoof, the equivalent of our nail, constitutes the whole foot. The small splint bones, however, resting behind the principal bone of the foot represent those portions (metacarpals) of the second and fourth digits which extend from the wrist to the fingers properly so called, and are to be viewed as traces of a foot composed of three toes in an ancestral form of the Horse, which we shall discuss presently. In the Tapir, the hind foot is composed of three well-developed toes, corresponding to the three middle toes in man, and in the Rhinoceros both feet are provided with three toes formed of the same three digits. In the extinct Palæotherium also, the foot is constituted very much as in the Rhinoceros.

FAMILY I.—EQUIDÆ, THE HORSE-TRIBE.

The Equidæ, or Horse-tribe, comprise several living and many extinct species. Three living members are restricted, in a state of nature, to Asia and Africa, and are divided into the true Horses, which have horny patches or callosities on the inner sides of both pairs of limbs—above the wrist in the fore, and on the inner side of the metatarsus on the hind limbs—and the Asses, which possess such callosities only on the fore-limb. With the latter are classed the Zebras and the Quaggas. All the

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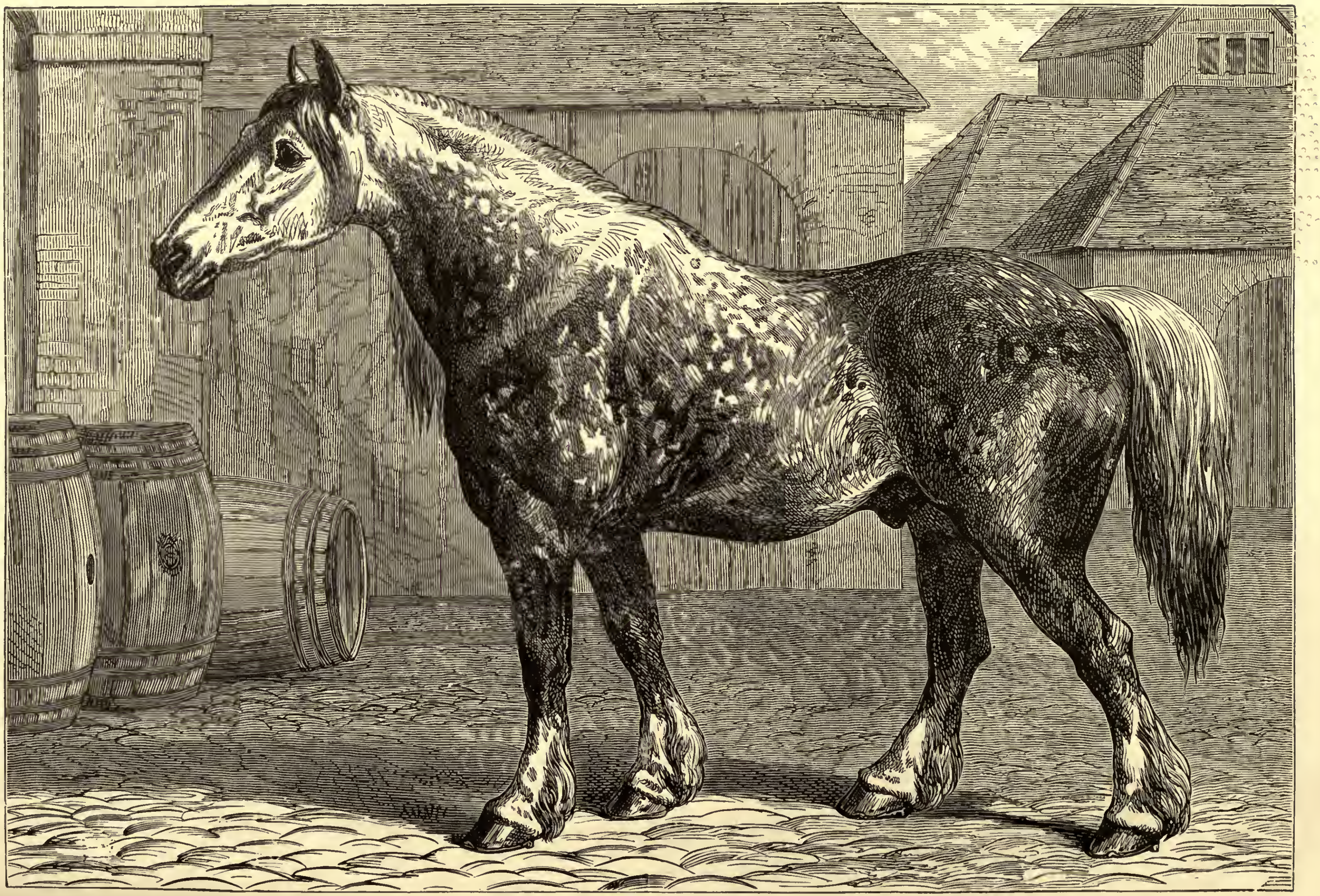


ENGLISH DRAY HORSE FROM THE STUD OF MESSRS. BARCLAY, PERKINS & CO.

WILD HORSE OF TARTARY.

existing and some of the extinct members of the family, are characterised by the feet being formed of one perfectly developed digit or toe only, the others being present in a rudimentary shape as the splint-bones. In the extinct Hipparion, however, and Anchithere, as we shall see presently, the accessory toes are well developed.

The true Horses are represented by one well-established species, *Equus caballus,* from which all the other races, or varieties, are descended, by a process of selection under the care of man, and these vary in size, proportion of parts, and colour, as much as any two closely-allied species of wild animals can be said to be defined from each other. According to Mr. Darwin, no aboriginal or truly Wild Horse is positively known to exist, for the Wild Horses of the East may probably be descended from those which have escaped from the service of man. In all probability the wild animal has been exterminated by the hand of man in those countries which it formerly inhabited, and in which it has left its remains to attest its former presence.

The Tarpan and Wild Horse of Tartary, which are to be found in thousands in the great treeless plains, present us with the nearest examples of the stock from which the Domestic Horses were probably derived. Their colour is mouse-coloured, with a stripe along the back. The best and strongest of these are caught by the Tartars by the aid of the lasso, and by the help of Falcons, which are trained to settle on the Horse's head, and flutter their wings, so as to take its attention away from the approaching hunter.

The first Domestic Horses known in Europe were introduced at a very early period, long before the dawn of history, in the period known by the archæologists as that of polished stone, or that in which man had not yet acquired a knowledge of the metals bronze or iron. They are met with in the ruins of those wonderful pile dwellings, which lie at the bottom of the Swiss lakes, in association with the remains of the Pig, Sheep, Goat, Short-horned Ox, large Ox of the Urus type, and Dog, and evidently belonged to a race of farmers, by whom they were introduced into Europe. Bones occur in the camps, sepulchres, and habitations of this age, throughout the whole of the Continent, and of Great Britain and Ireland. In all probability they were used at this time not for riding or for driving, but for food. In the succeeding, or bronze age, however, they were employed for purposes of riding, as may be seen from the discovery of the bronze bits, which have been met with in France and Italy. They were probably introduced by a race of nomads, who no doubt brought Horses with them from the steppes of Central Asia.

According to Colonel Hamilton Smith, "so little is known of the primitive seat of civilisation—the original centre, perhaps, in Bactria, in the higher valleys of the Oxus, or in Cashmere, whence knowledge radiated to China, India, and Egypt—that it may be surmised that the first domestication of the *post-diluvian* Horse was achieved in Central Asia, or commenced nearly simultaneously in several regions where the wild animals of the Horse form existed."

The Horse was universally used for food by man before the historic period, and would be used now in Europe more generally than it is, were it not for an edict of the Church in the eighth century. During the Roman occupation of Britain, it formed a large part of the diet of the inhabitants; by the Scandinavians it was eaten in honour of Odin. As Christianity prevailed over the heathen worship, it was banished from the table. It appears, however, that it was used in England as late as the year 787, after it had been prohibited in Eastern Europe. The ecclesiastic rule, however, was not always obeyed, for the monks of St. Gall, in Switzerland, not only ate Horse-flesh in the eleventh century, but returned thanks for it in a metrical grace, which has survived to our times on account of its elegance and beauty.

It is somewhat remarkable that the Horse is, with few exceptions, mentioned in the Bible only in connection with war, and that there is a wonderful absence of detail with regard to its nature and habits otherwise than for the purposes it served in battle. That the Horse spoken of in Scripture was nearly identical with the Arab Horse of to-day there can be little doubt, if we examine the various sculptures and paintings which are handed down to us, and which speak of the faded glories of Egypt and Assyria. The first account we have of the Horse is during the famine in Egypt that was foretold by Joseph, and here we find that it was evidently an Egyptian animal. "And they brought their cattle unto Joseph; and Joseph gave them bread in exchange for Horses, and for the flocks, and for the cattle of the herds, and for the Asses; and he fed them with bread for all their cattle for that year."

The courage and fiery nature of the Arab Horse, particularly fitting it for use in the wars of ancient times, were evidently well understood. In the Book of Job (xxxix. 19–25) we read:—"Hast thou given the Horse strength? hast thou clothed his neck with thunder? Canst thou make him afraid as a grasshopper? the glory of his nostrils is terrible. He paweth in the valley, and rejoiceth in his strength: he goeth on to meet the armed men. He mocketh at fear, and is not affrighted; neither turneth he back from the sword. The quiver rattleth against him, the glittering spear and the shield. He swalloweth the ground with fierceness and rage: neither believeth he that it is the sound of the trumpet. He saith among the trumpets, Ha, ha! and he smelleth the battle afar off, the thunder of the captains, and the shouting."

The Hebrews in the patriarchal age did not require Horses, and for a long time after their settlement in Canaan did not use them, probably partly on account of the nature of the country, which was hilly, and partly because they were prohibited on account of their hostility to the Egyptians. The Horses of the kings David and Solomon were derived from Egypt. In the reign of the latter, a Horse was worth 150 shekels of silver, and a chariot six hundred. The former was the first to establish a force of cavalry and chariots.

From the very earliest ages known to the historian in Egypt and Assyria, Horses were used for purposes of war, and were yoked in pairs, and sometimes in threes, to the war-chariots in which the kings and great captains rode. They are generally depicted as being of upright or

Hog manes. Horsemen were also employed by both nations, but they were evidently not thought so important as Horses and chariots for warlike purposes.

In the earlier period of Greek history, and in Homeric times, the art of riding was utterly unknown to the Greeks, for if a man was seen on horseback he was supposed to be a Centaur. Down to 500 B.C. riding was not practised by the Greeks, although it was well known to the Barbarians. As we get close to the year mentioned, we hear of Persian cavalry; for instance, the great question with regard to the battle of Marathon (490 B.C.) is, What were the Persian cavalry doing? And at the same period we find that cavalry had become an important arm in Northern Greece. Throughout all the times of Greek pre-eminence, Horses were mainly used for the purpose of the chariot. The utmost care and attention were devoted to their breeding, and the greatest expense incurred in the maintenance of a stud, which was a luxury possible only to the very richest persons, and almost entirely beyond the means of private individuals. The greatest horsekeepers, and consequently winners in the chariot-races, were almost entirely princes and ruling families.

After 450 B.C. we begin to hear of riding and of cavalry in Greece proper, side by side with charioteers. Books were written on the art, one of which, from the pen of Xenophon, is still extant.

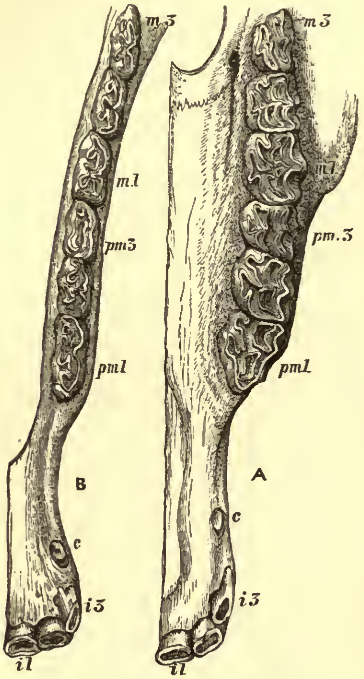
The case is totally different when we turn to the history of Rome during the same period. In the early regal times, and in the first centuries of the Republic, cavalry was the most important arm of the military service. It was naturally composed of the aristocracy, who alone could bear the expense of a Horse. It was only when a rich middle class had sprung up, and were denied the aristocratic privilege of serving on horseback, that the heavy-armed infantry, which in later times won all the great Roman victories, came first into existence. As they increased, the cavalry decreased in importance, and the typical Roman soldier was what was called in mediæval times a man-at-arms.

The native breeds of Horses in Britain, before the Roman conquest, are known to us merely from a reference to them by Cæsar, that they were powerful and well suited for purposes of war by their stature and training. They were used in the battles of the Romans, yoked to the chariots. They were evidently considered of great importance, since they appear on some of the early British coins—as, for example, those of Cunobelin. After the conquest of Britain by the Angles, Jutes, and Saxons, the Horses demanded more attention than before. Athelstan thought the preservation of the native breed of sufficient importance to call for a legal enactment to prevent the export of Horses, excepting as presents. Saddle-horses were employed, according to the testimony of Bede, in England in the early part of the seventh century, and from the notices in the Anglo-Saxon Chronicle it is evident that they were frequently used by the Danes for purposes of transport from one part of the country to another; and in the song of the fight of Maldon, we read of Goderic flying from the field on a Horse, on which his lord had ridden down to the battle.

The first attempt on record to improve the native breed, by the introduction of foreign blood, was by the importation of "running Horses" from Germany in the time of Athelstan; in whose reign also many Spanish Horses were imported. William the Conqueror, who owed his success in the Battle of Hastings to his cavalry, paid great attention to the English breed. In his time, Professor Bell tells us, "Roger de Belesme, Earl of Shrewsbury, imported the elegant and docile Spanish Horse, and bred from it on his estates in Powisland; and it is recorded that the Horses of that part of Wales were long celebrated for their swiftness, a quality which they had doubtless derived from this happy mixture of blood. The heavy panoply of mail, however, with which the warriors of this and of succeeding ages at once protected and loaded both themselves and their steeds, sufficiently attests that the cavalry must have been mounted on Horses of great strength and size; and there is no doubt that, until the universal employment of firearms rendered such a protection in a great measure unavailable, the speed and figure of the War Horse must have been sacrificed to the qualities of power and endurance. The beautiful Horses on which many of our light cavalry regiments are now mounted, although endowed with considerable strength, would have been crushed beneath the weight of metal by which both the knight of olden time and his Horse were so heavily laden."

King John paid great attention to the improvement of the breed for agricultural purposes; and to him, according to Youatt, we are indebted for our Draft Horses. He imported no less than a hundred Flanders stallions, which probably laid the foundation of the strength and size which are the eminent characteristic of our Horses of war and labour. Edward III. was a zealous patron of the course, and in his reign the heavy native breed was crossed with lighter Horses of Spanish origin, the offspring of the Arabs, which had been introduced by the Moors. From this time forwards, great pains were taken by the English sovereigns to improve the breeds; races were regularly established in various parts of the kingdom, and various enactments were passed to secure excellence. James I. gave as much as five hundred pounds—an enormous sum, according to the value of money in those times—for an Arabian; and in the Protectorate of Cromwell, Horses were introduced from the south-east and from Morocco, by which beauty of form, and a degree of swiftness before unknown, were added to the stoutness which had hitherto characterised English Horses. In the time of Charles II., we may remark that the bell, which had hitherto been the prize of the successful Horse in racing, was exchanged for the cup, which has continued to be the prize down to the present day.

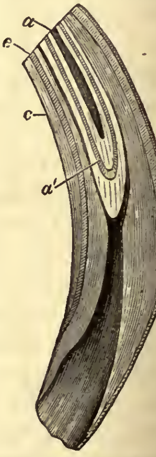
Mr. Darwin considers that the cause of modification in the forms of Horses greatly arises from their varying conditions of life; that, for instance, Horses living in mountainous regions, or on small islands, become reduced in size from want of a variety of food. Corsica and Sardinia have native breeds of Ponies; and the Puno Ponies living in the lofty regions of the Cordilleras are said to be strange little creatures. But Horses can withstand intense cold, as they live wild on the plains of Siberia, where they scrape away the snow in order to get at the herbage underneath. Not only do the wild Tarpans in the East possess this instinct, but also those that have run wild on the Falkland Islands, as well as the Horses in North America descended from those brought into Mexico by the Spaniards.



DENTITION OF HORSE.
(A) upper, (B) lower, jaw.

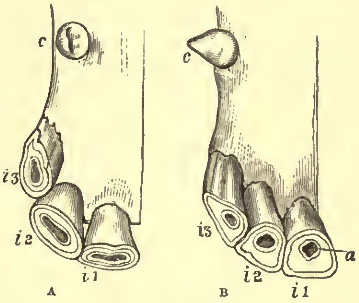
That the original colour of the Horse was dun may be gathered from evidence dating as far back as the time of Alexander the Great, and the wild Horses now in Western Asia and Eastern Europe are of the same colour. In Hungary and Norway, duns with a stripe down the spine are considered of an aboriginal colour.

The series of permanent teeth in the Horse consists of three incisors, one canine, three premolars, and three molars in each jaw, or 40 in all; and is of great interest. The grinders (or molars and premolars) are remarkable for their length, the complexity of their pattern, and for the thick coating of cement which fills up the interspaces of the folds of enamel. The incisors present a peculiar pattern, which is of great importance in deciding the age of a Horse. Each is covered with a layer of enamel, which is folded inwards at the top, after the manner of the finger of a glove, the top of which has been pulled inwards, as is seen in the accompanying figure of a vertical section of an incisor tooth. This hollow is filled with cement, and its state of wear enables the age of the Horse to be ascertained, constituting "the mark."

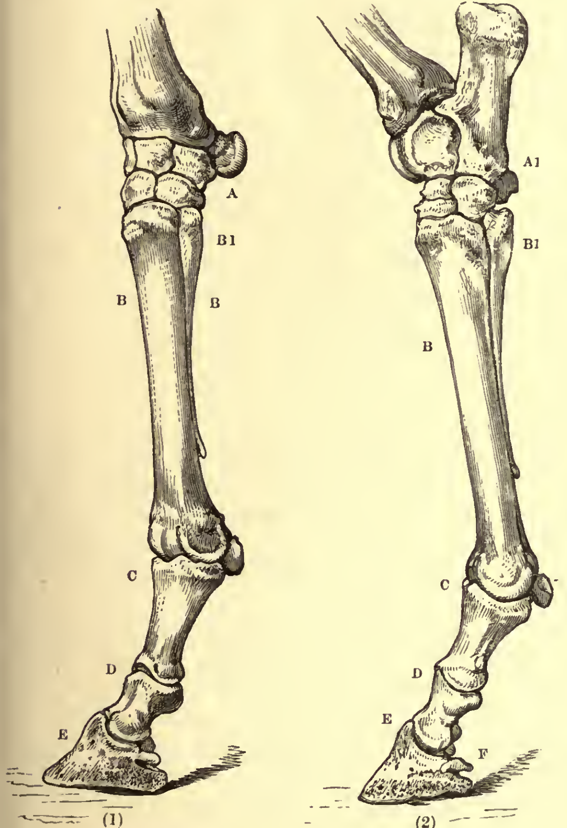


VERTICAL SECTION OF INCISOR OF HORSE.
(*After Owen.*)
e, enamel; c, cement; a a', inverted fold of enamel, &c. ("the mark").

A Colt when born has usually the first and second molars forced through the gum, and at seven or eight days old the two central incisor teeth appear; five or six weeks later, the next two incisors. At three months, they are equal to the central ones, and both pairs have nearly reached their natural level. A third grinder has then appeared; and about the eighth month, the third incisor above and below on each side. The Colt has now his full complement of incisor teeth—viz., six in each jaw. At six months the obliteration is apparent in the four central incisors; and at a year and a half the mark will be very faint in the central incisors, and diminished in the other two. A fourth molar appears at twelve months, and a fifth at two years. These are all milk or temporary teeth. At about three years old, the central pair of incisors, or nippers, both in the upper and lower jaws, are pushed upwards and removed by two permanent teeth, which take their place, and which are distinguishable from the milk teeth by their increased size; a three-year-old Colt, therefore, is easily recognised by the possession of these two new and enlarged incisors. At three years and a half the second incisors will have given place to permanent ones; and at four and a half the remaining incisors will have followed suit. Thus at four years old the central nippers will be fully grown; the next pair will not have attained their full size, and the corner temporary incisors will be worn small, and the mark nearly obliterated. At five years old the mark from the central teeth begins to be effaced, the next pair fully grown, and the corner pair only partially grown. Between the fourth and fifth year the canines begin to appear in the male, two in each jaw; in the female they do not appear until old age. At six years old the mark on the central nippers is much diminished, or obliterated. The other incisors will also be worn, and the canines fully developed. At seven the mark on the next pair of incisors is nearly gone, and the canines rounded at the point and edges. At eight the mark disappears from all the incisor teeth, and the canines are much rounder and blunter. From this time the age of a Horse is difficult to decide, and the teeth of the upper jaw seem to be the best guides. In the accompanying figure (B) the incisors of a Horse aged sixteen years are represented, in which it will be observed that the oval island of enamel, or "mark," has been obliterated, and its place is indicated by a round, dark, island (A), composed of osteo-dentine, which has been formed within the pulp-cavity of the tooth. The absence of the fine white crystalline enamel from the centre of the tooth at once points out the aged Horse from that "in mark," and renders all attempts to produce by artificial means the same pattern impossible, though this trick is by no means unknown or unattempted in horse-dealing.



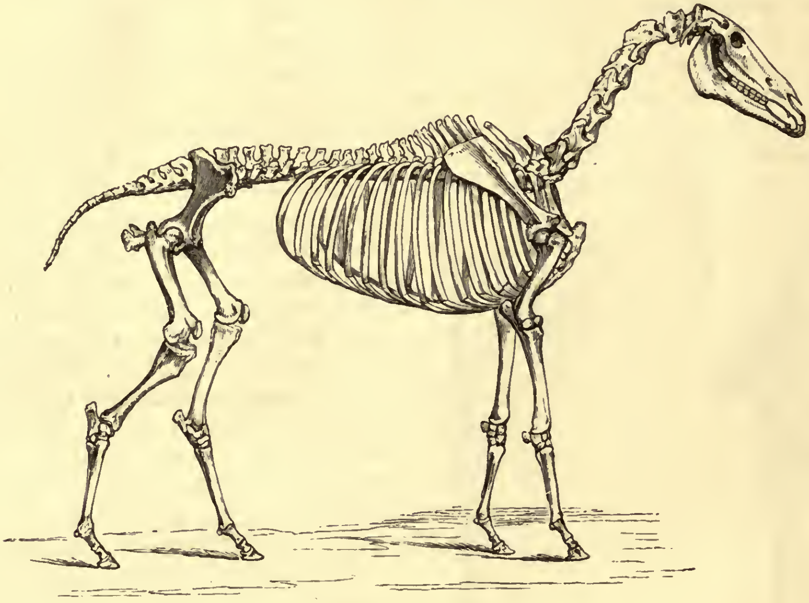
INCISORS AND CANINES OF HORSE (B) AND MARE (A).



BONES OF FORE (1) AND HIND (2) LIMBS OF HORSE.

A, Carpus (knee); A1, Tarsus (hock); B, Cannon bone; B1, Splint bone; C, Greater Posterior; D, Coronet; E, Coffin bone; F, Navicular.

In the whole anatomy of the Horse there is no organ more beautifully adapted for the purposes it serves than the foot, and it is well worthy to be discussed at some length. The foot practically consists of the three last bones of the limb. The bones are firmly bound together by ligaments, affording also attachment to the wonderfully strong tendons by which the foot is moved. A mass of gristle called the lateral cartilage is placed on each side, and behind the bones is an elastic pad which is termed the plantar cushion. A fibrous layer is placed over these, and enveloping the whole is a horny covering known as the hoof. Immediately below the carpus, or the so-called knee of the Horse, in the fore limb, and below the tarsus or hock in the hind limb, we find what are termed the cannon bones. These, which differ little in either fore or hind leg, are really, in point of fact, respectively the metacarpal and metatarsal bones. On each side, towards the hinder part of these cannon bones, is a bone termed the splint. These splints are in fact rudimentary metacarpal and metatarsal bones. The cannon bones run in a direction vertically downwards, and in the best possible manner for supporting a heavy weight, and in addition the bones are composed of extraordinarily hard and dense material, although to all appearance they are comparatively slender. Altogether, the object looked for is attained—namely, strength with symmetry. The cannon or shank bone proceeds downwards until it reaches a bone known as the greater pastern, and between these two are also two little bones, termed the sesamoids: this portion of the leg is called the fetlock. The sesamoid bones are attached to the back of the cannon bone, and are so arranged as to increase the surface of the joint, and also forming a pulley for the passage of the back tendons. The pastern bone rests immediately upon a bone termed the little pastern or coronet, the former bone being placed obliquely downwards and forwards, being an admirable provision against concussion. It is here, in proportion to the oblique position in which this bone is placed, the horseman finds either a springy or jolting action in the Horse he rides. The little pastern or coronet rests upon a bone known as the coffin. (The three bones—viz., the greater pastern, the little and the coffin bone—are really nothing more nor less than three phalanges, the three together being analogous to the human finger or toe.) It is situated partly within and partly without the hoof, and its direction, like the greater pastern, is downwards and forwards, and it is this bone which forms the pivot or centre of motion.

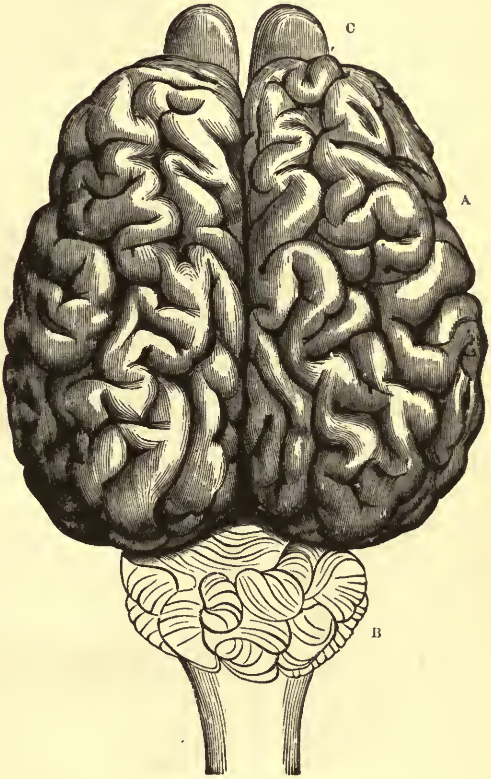


SKELETON OF HORSE.

The last bone of the foot, and immediately below the little pastern, as before stated, is the coffin or pedal bone. This bone is strongly imbedded in the hoof, and is convex in front, rounded at the sides, and slightly concave on its under surface. There is around the front and sides of the coffin bone a considerable degree of roughness for the attachment of muscles, which part of the foot is termed the sensitive. The under part is comparatively smooth. Between the coffin and little pastern is a small oblong flattened bone, termed the navicular. It is covered over on its under surface by a smooth cartilaginous layer. This bone probably helps to ward off concussion, also to give a larger surface for membranes containing synovial fluid, or what is known as "joint oil," which preserves the joints from too great friction.

The more striking features in the skull of the Horse are the completion of the orbital ring behind by the union of the frontal and jugal bones, and the edentulous space in front of the molar series, into which the bit is inserted in riding or driving. The brain is large, and that part of it known as the cerebrum, or "big brain" (A), is deeply folded; it does not, however, overlap the cerebellum, or "little brain" (B), or the olfactory lobes (C). The spinal column is composed of seven cervical, twenty-four dorsal, five sacral, and about seventeen caudal vertebræ.

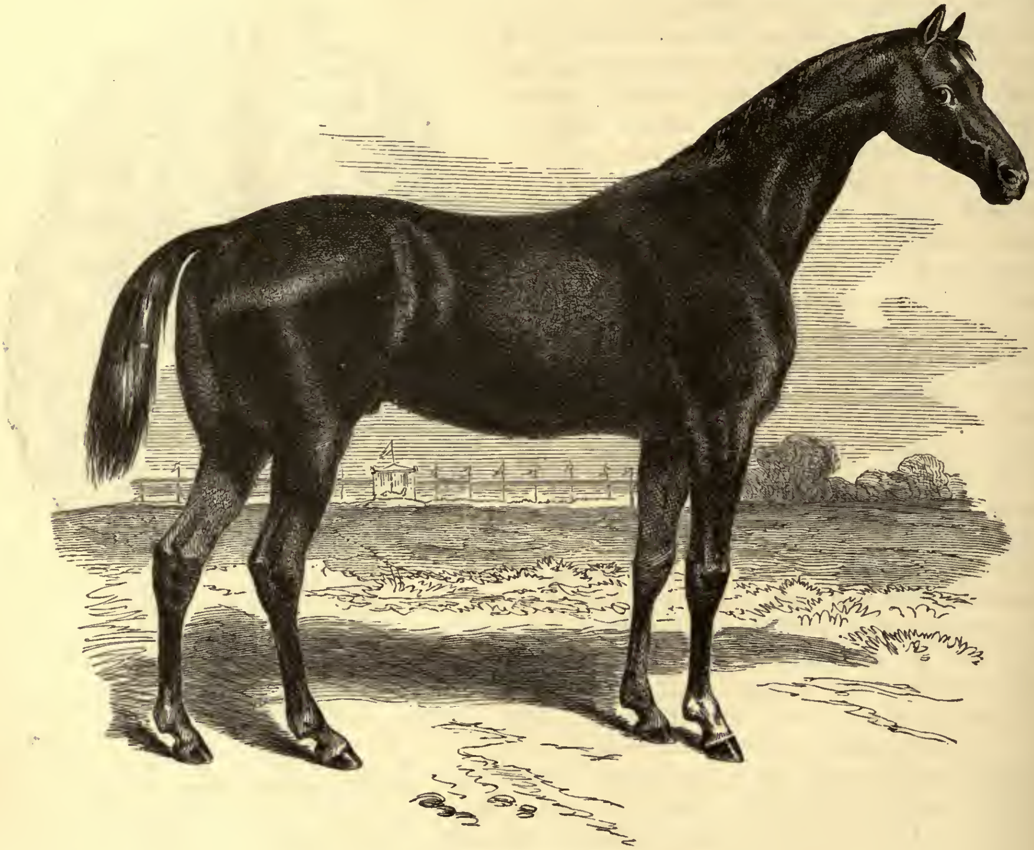
Of the various diseases the stomach of the Horse is liable to, perhaps the most peculiar is that caused by an insect known as the Gad-fly. With regard to this creature and its mode of attack, Youatt gives the following information:—"In the spring and early part of the summer, Horses are much troubled by a gnat or caterpillar, which causes a great deal of itching and uneasiness. Grooms are sometimes alarmed at the appearance of these insects. Their history is peculiar, and will dispel every fear with regard to them. We are indebted to Mr. Bracy Clark for almost all we know about them. A species of Gad-fly (*Œstrus equi*) is, in the latter part of the summer, exceedingly busy about the Horse. It is observed to be darting with great rapidity towards the knees and sides of the animal. The females are depositing their eggs on the hair, which adhere to it by means of a glutinous fluid with which they are surrounded. In a few days the eggs are ready to be hatched, and the slightest application of warmth and moisture will liberate the little animals which they contain. The Horse, in licking himself, touches the egg; it bursts, and a small worm escapes, which adheres to the tongue, and is conveyed with the food into the stomach. There it clings to the cuticular portion of the stomach by means of a hook on either side of its mouth; and its hold is so firm and so obstinate, that it must be broken before it can be detached. It remains there feeding on the mucus of the stomach during the whole of the winter, and until the end of the ensuing spring; when, having attained a considerable size, and being destined to undergo a certain transformation, it disengages itself from the cuticular coat, is carried into the villous portion of the stomach with the food, passes out of it with the chyme, and is evacuated with the excrement. The larva, or maggot, seeks shelter in the ground, and buries itself there; it contracts in size, and becomes a chrysalis or grub, in which state it lies inactive for a few weeks, and then, bursting from its confinement, assumes the form of a fly. The female, becoming impregnated, quickly deposits her eggs on those parts of the Horse which he is most accustomed to lick, and thus the species is perpetuated.



BRAIN OF HORSE.

"There are several plain conclusions to be drawn from this history. The bots cannot, while they inhabit the stomach of the Horse, give the animal any pain, for they have fastened on the cuticular and insensible coat. They cannot stimulate the stomach and increase its digestive power, for they are not on the digestive portion of the stomach. They cannot, by their roughness, assist the trituration or rubbing down of the food, for no such office is performed in that part of the stomach; the food is softened, not rubbed down. They cannot be injurious to the Horse, for he enjoys the most perfect health when the cuticular part of his stomach is filled with them; and their presence is not even suspected until they appear at the anus. They cannot be removed by medicine, because they are not in that part of the stomach to which medicine is usually conveyed: and if they were, their mouths are too deeply buried in the mucus for any medicine, that can safely be administered, to affect them; and last of all, in due course of time they detach themselves, and come away. Therefore the wise man will leave them to themselves."

THE RACE-HORSE.—The breed of Horses for which England is chiefly remarkable is the Race-Horse, resulting from a cross of the English stock with the Arabian; and this was chiefly brought about by the care of Mr. Darley. The offspring of the Arabian thus introduced was the Devonshire, or Flying Childers, the fleetest Horse of his time, which ran four miles, one furlong, and a hundred and thirty-eight yards in seven minutes and a half. Descended from the same Arabian was Eclipse, who never met an opponent sufficiently fleet to test his powers. He became the sire of three hundred and thirty-four winners; while King Herod, a descendant of the same stock, was the sire of no less than four hundred and ninety-seven winners. The former of these Horses died in 1789, at the age of seventy-five years, after realising for his owner a princely fortune: his skeleton is now preserved in the museum at Oxford. The English Race-Horse, in swiftness and energy, elegance and grace, surpasses his Arabian progenitor; and is so superior to other European breeds, that it is usual on the English course to allow foreign Horses an advantage in the weight that they carry. All English Race-Horses are descended either from Arabian or Barb sires.



ENGLISH RACE-HORSE.

THE TROTTING HORSE OF AMERICA.—Two nations have the credit of introducing a race of Horses known as the Trotting Horse. One of these is Russia, the other the United States; and the latter has so far excelled her rival, that the Trotting Horse is now generally known as the "Trotting Horse of America." The Russian breed is Arabian on a Flemish stock, and is known as the Orloff Trotter; but from the bending of the knee when the Horse is striding, and the trotting action not being carefully looked after, the animal is considered by good judges to be only "half-developed." The breed of the American Trotter seems to have been both Barb and Arabian on an English stock, the well-known Bashaw Trotters being descended from an imported Barb ancestor, the Grand Bashaw; and Top Gallant was produced by a union of Arab or Eastern breed, with some Horse either English or of English origin. One of the greatest American trainers of the Trotting Horse, Hiram Woodruff, says in his work on this subject that the English had the stock all along, as much as the Americans,

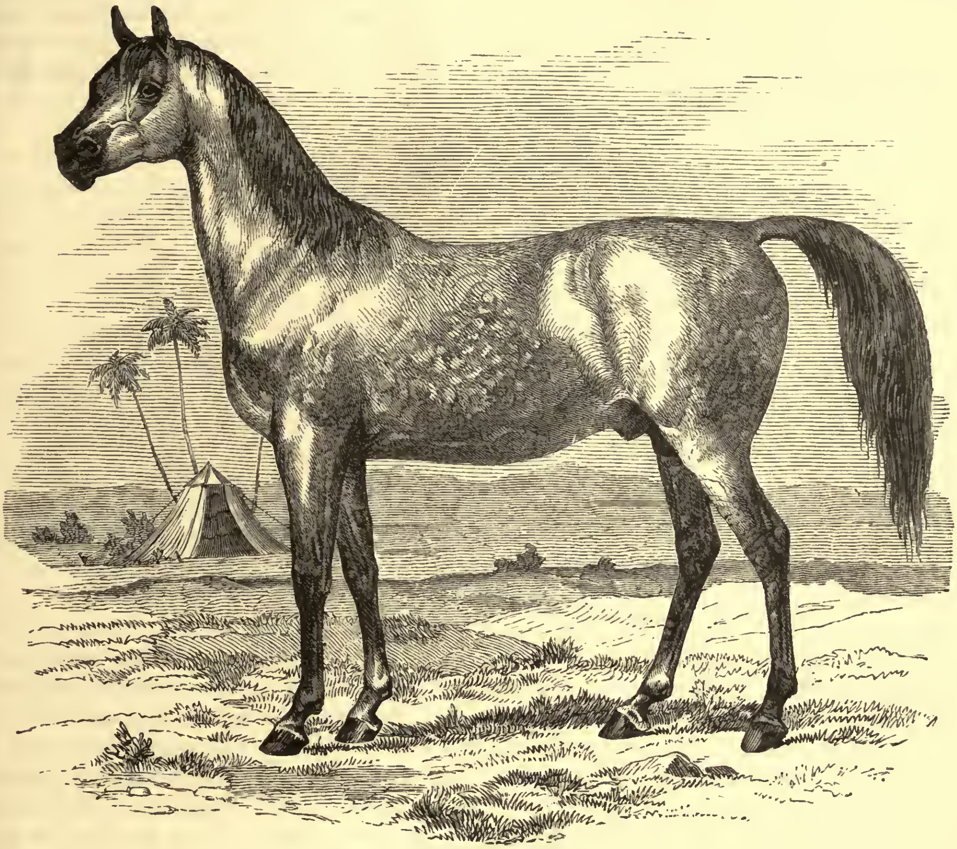
SHETLAND PONIES.

but that the method of training and perseverance of the latter have produced the best and fastest trotters. He entirely disputes the idea of the trot being an artificial action of a Horse, and the common notion that the only two natural paces of that animal are the walk and the gallop; and in vindication of his theory he asks, "Whether a colt can now be found anywhere that does not trot sometimes, and that when he is by the side of his dam, before ever the hand of a man has been laid upon him? If it is said that this results from the long domestication of his ancestors, my reply will be that it happens among the produce of Horses whose ancestors for more than two centuries have never been used for trotting, and were never taught to trot at all, if it is true that the Arabs of the desert only use their Horses at the two so-called natural paces, the walk and the gallop." He further remarks that other animals trot when wild, such as the wild Asses, Zebras, and Quaggas, as well as the Deer and the Elk. He therefore considers that the most careful attention should be given to the training of a young colt for trotting purposes; and that, for a Horse to become a trotter, he should at the early age of two years be broken in with a view to that purpose especially, while his gallop or walk should, so to speak, be kept in the background. His education altogether extends over several years, as both speed and durability have to be considered in his capabilities; sometimes he reaches the age of seven years before his finest powers can be developed. Some of the fastest English trotters go at the rate of a mile in three minutes; while the quickest in America, according to Mr. Woodruff, take only two minutes and twenty-five seconds, or thereabouts, to do the same distance. The Trotting Horse has now become a product of great commercial value to the Americans.

THE DRAY HORSE.—The huge Dray Horse, in its massive form and ponderous strength, and slowness of gait, forms a striking contrast to the Racer and the Trotting Horse. It is as admirably fitted for the slow carriage of heavy weights as the two last are for their elegant swiftness. It is as good an example of the results of judicious selection on the part of man, for a definite purpose, as can be offered by the study of any of the domestic animals.

THE SHETLAND PONY.—The smallest variety of Horses in the British Islands is the Shetland Pony, which averages seven or eight hands in height, but yet is wonderfully strong, and capable of enduring an immense amount of fatigue. Its wild, shaggy mane gives it somewhat the appearance, as has been remarked, of a Skye Terrier. It is mischievous and skittish, and generally harder to ride than a full-sized Horse.

THE ARAB AND THE BARB.—The two principal varieties of foreign Horses which are important for us to consider are the Arab and the Barb. The Arab would not be acknowledged by every one to be perfect in form. The head, however, is inimitable. "The broadness and squareness of the forehead," writes Youatt, "the smallness of the ears, the prominence and brilliancy of the eye, the shortness and fineness of the muzzle, the width of the nostril, the thinness of the lower jaw, and the beautifully-developed course of the veins, will always characterise the head of the Arabian Horse. The body of the Arab may, perhaps, be considered as too light, and his chest too narrow; but behind the arms the barrel generally swells out, and leaves sufficient room for the play of the lungs. The neck of the Arabian is long and arched, and beautifully joined to the chest. In the formation of the shoulder, next to that of the head, the Arab is superior to any other breed. The withers are high, and the shoulder-blade has its proper inclination backwards. It is also thickly clothed with muscle, but without the slightest appearance of heaviness. The fineness of his legs, and the oblique position of the pasterns, might be supposed by the uninitiated to lessen his apparent strength; but the leg, although small, is deep, and composed of bone of the densest character. The tendons are sufficiently distinct from the bone, and the starting muscles of the fore-arm and the thigh indicate that he is fully capable of accomplishing many of the feats that are recorded of him. It is an error," continues Youatt, "into which almost every writer on the history of the Horse has fallen, that the Arabian is bred in the arid deserts, and owes the power of endurance which he possesses in his adult state to the hardships which he endured while he was a colt. The real fact is, that the Arabs select for their breeding-places some of those delightful spots, known only in countries like these, where, though all may be dry and barren around, there is pasture unrivalled for its succulence, and its nutritious or aromatic properties. The powers of the young animal are afterwards developed, as they alone could be, by the mingled influence of plentiful and healthy food, and sufficient, but not, except in one day of trial, cruel exercise." The attachment an Arab feels for his Horse is proverbial, cases having been recorded of a devotion so deep that the owner prefers almost to starve rather than part with his Horse. The following anecdote is an instance:—"The whole stock of an Arab of the desert consisted of a mare. The French Consul offered to purchase her, in order to send her to his Sovereign, Louis XIV. The Arab would have rejected the proposal, but he was miserably poor; he had scarcely a rag to cover him, and his wife and children were starving. The sum offered was great; it would provide him and his family with food for life. At length, and reluctantly, he yielded. He brought the mare to the dwelling of the consul, dismounted, and stood leaning upon her; he looked now at the gold, and then at his favourite. 'To whom is it,' said he, 'I am going to yield thee up? To Europeans, who will tie thee close; who will beat thee; who will render thee miserable. Return with me, my beauty, my jewel, and rejoice the hearts of my children!' As he pronounced the last words, he sprang upon her back, and was presently out of sight."


ARAB HORSE.

The Barb is found throughout the North of Africa, from the Mediterranean to the Sahara desert, and has obviously been introduced by the Moors. It is to the Barb that the principal excellence of the Spanish Horse is due; and to this Horse, as well as to the Arab, may be assigned a large share in producing the English Hunter and Racer. All English thoroughbreds are descended from one or other of these.

The Persian Horse is closely allied to the Arab, and possesses great powers of endurance. The distance marked for a race, which Sir R. K. Porter saw, was no less than four-and-twenty miles. In some points, according to Youatt, the Persian Horse excels the Arabian.

Wild Horses in America.—At the time of the discovery of America there were no Horses in any part of that continent, although the boundless prairies were admirably fitted for the support of countless herds. Soon, however, those imported by the settlers strayed away, and as a consequence horses are now met with in vast numbers, in some cases amounting, it is said, to ten thousand in one troop. They appear to be under the command of a leader, the strongest and boldest of the herd, whom they implicitly obey. When threatened with danger, at some signal, understood by them all, they either close into a dense mass and trample their enemy to death, or, placing the mares and foals in the centre, they form themselves into a circle and welcome him with their heels. The leader first faces the danger, and when prudence requires a retreat all follow his rapid flight. In the thinly inhabited parts of South America, according to Youatt, it is dangerous to fall in with any of these troops. The Wild Horses approach as near as they dare; they call to the loaded Horse with the greatest eagerness, and if the rider is not on the alert, and has not considerable strength of arm and sharpness of spur, his animal will divest himself of his burden, take to his heels, and be gone for ever. Byron well describes the Wild Horse in his "Mazeppa":—

"A trampling troop; I see them come!
In one vast squadron they advance!
I strove to cry—my lips were dumb.
The steeds rush on in plunging pride;
But where are they the reins to guide?
A thousand horse—and none to ride!
With flowing tail, and flying mane,
Wide nostrils—never stretch'd by pain,
Mouths bloodless to the bit or rein,
And feet that iron never shod,
And flanks unscarr'd by spur or rod,
A thousand horse, the wild, the free,
Like waves that follow o'er the sea.
On came the troop . . .
They stop—they start—they snuff the air,
Gallop a moment here and there,
Approach, retire, wheel round and round,
Then plunging back with sudden bound,
They snort—they foam—neigh—swerve aside,
And backward to the forest fly."

Of the meeting a troop of Wild Horses in a more thickly inhabited part of the country, Sir F. Head gives some interesting details. He describes some unfortunate captured animals as being forced along by their riders at their very utmost speed: "As they are thus galloping along, urged by the spur, it is interesting to see the groups of Wild Horses one passes. The mares, which are never ridden in South America, seem not to understand what makes the poor Horse carry his head so low and look so weary. The little innocent colts come running to meet him, and then start away frightened; while the old Horses, whose white marks on the flanks and backs betray their acquaintance with the spur and saddle, walk slowly away for some distance, then breaking into a trot as they seek their safety, snort and look behind them, first with one eye and then with the other, turning their noses from right to left, and carrying their long tails high in the air."

The capture and breaking in of Wild Horses in America are described by Miers as follows:—

"The lasso is a missile weapon, used by every native of the United Provinces and Chili. It is a very strong plaited thong of equal thickness, half an inch in diameter, and forty feet long, made of many strips of green hide, plaited like a whip-thong, and rendered supple by grease. It has at one end an iron ring, above an inch and a half in diameter, through which the thong is passed, and this forms a running noose. The Gaucho, or native peon, is generally mounted on horseback when he uses the lasso. One end of the thong is affixed to his saddle-girth; the remainder he coils carefully in his left hand, leaving about twelve feet belonging to the noose end in a coil, and a half of which he holds in his right hand. He then swings this long noose horizontally round his head, the weight of the iron ring at the end of the noose assisting in giving to it, by a continued circular motion, a sufficient force to project it the whole length of the line." The Gauchos drive the Wild Horses into a corral, which is a circular space surrounded by rough posts firmly driven into the ground. The corral, relates Miers, "was quite full of Horses, most of which were young ones about two or three years old. The *Capitar* (chief Gaucho), mounted on a strong, steady Horse, rode into the corral, and threw his lasso over the neck of a young Horse and dragged him to the gate. For some time he was very unwilling to lose his comrades; but the moment he was forced out of the corral his first idea was to gallop away; however, a timely jerk of the lasso checked him in the most effectual way. The peons now ran after him on foot and threw a lasso over his fore legs, just above the fetlock, and twitching it, they pulled his legs from under him so suddenly that I really thought the fall he got had killed him. In an instant a Gaucho was seated on his head, and with his long knife, in a few seconds, cut off the whole of the Horse's mane, while another cut the hair from the end of his tail: this, they told me, was a mark that the Horse had been once mounted. They then put a piece of hide in his mouth to serve for a bit, and a strong hide halter on his head. The Gaucho who was to mount arranged his spurs, which were unusually long and sharp, and while two men held the Horse by his ears, he put on the saddle, which he girthed extremely tight. He then caught hold of the Horse's ear, and in an instant vaulted into the saddle; upon which the man who held the Horse by the halter threw the end to the rider, and from that moment no one seemed to take any further notice of him. The Horse instantly began to jump in a manner which made it very difficult for the rider to keep his seat, and quite different from the kick or plunge of an English Horse; however, the Gaucho's spurs soon set him going, and off he galloped, doing everything in his power to throw his rider. Another Horse was immediately brought from the corral; and so quick was the operation that twelve Gauchos were mounted in a space which, I think, hardly exceeded an hour. It was wonderful to see the different manner in which different Horses behaved. Some would actually scream while the Gauchos were girding the saddle upon their backs; some would instantly lie down and roll upon it; while some would stand without being held, their legs stiff and in unnatural positions, their necks half bent towards their tails, and looking vicious and obstinate; and I could not help thinking that I would not have mounted one of those for any reward that could be offered me, for they were invariably the most difficult to subdue. It was now curious to look around and see the Gauchos on the horizon in different directions, trying to bring their Horses back to the corral, which is the most difficult part of their work, for the poor creatures had been so scared there that they were unwilling to return to the place. It was amusing to see the antics of the Horses; they were jumping and dancing in different ways, while the right arm of the Gauchos was seen flogging them. At last they brought the Horses back, apparently subdued and broken in. The saddles and bridles were taken off, and the young Horses trotted off towards the corral, neighing to one another. When the Gaucho wishes to take a Wild Horse, he mounts one that has been used to the sport and gallops over the plain. As soon as he comes near his victim, the lasso is thrown round the two hind legs, and as the Gaucho rides a little on one side, the jerk pulls the entangled Horse's feet laterally, so as to throw him on his side without endangering his knees or his face. Before the Horse can recover the shock, the rider dismounts, and snatching his *poncho*, or cloak, from his shoulders, wraps it round the prostrate animal's head. He then forces into his mouth one of the powerful bridles of the country, straps a saddle on his back, and bestriding him, removes the poncho; upon which the astonished Horse springs on his legs, and endeavours by a thousand vain efforts to disencumber himself of his new master, who sits quite composedly on his back, and, by a discipline which never fails, reduces the Horse to such complete obedience that he is soon trained to lend his whole speed and strength to the capture of his companions."

WILD HORSES IN AUSTRALIA.—In Australia, as well as in America, the Horses imported by the colonists have escaped into the wilds, and reverted to their feral condition. They are known as "Brumbies," and are a serious inconvenience to the stock farmer, because they entice away his Horses and spoil his carefully selected breeds. The animal develops wonderful sagacity in avoiding the sportsman, and his keenness of scent and vigilance are certainly as great as in any other animal which seeks in flight safety from man. These Brumbies were described by Anthony Trollope, himself an ardent Fox-hunter, as being perfect marvels of ugliness. These animals are found in enormous numbers in some districts. In 1875, for example, no less than seven thousand are stated to have been shot in one station in New South Wales, still leaving plenty behind to perpetuate the race.

THE ASS.—Four species of Asses and three of Zebras are described by naturalists, but our domestic animal is probably descended from one alone; the *Asinus teniopus* of Abyssinia. In Great

Britain, and generally in Central Europe, the Ass has not given rise to distinct breeds like those of the Horse, a fact which may be accounted for, as Mr. Darwin remarks, by the animal being kept by poor persons who do not carefully match and select the young. Its small size in England and Northern Europe is probably due far more to want of care in breeding than to cold, for in Western India it is not much larger than a Newfoundland Dog, being usually not more than from twenty to thirty inches high.

The Ass varies greatly in colour, and its legs, especially the fore legs, are sometimes transversely barred; a fact which may be explained on the hypothesis of the reappearance of the attributes of the parental form. "The stripes," Mr. Darwin says, "are believed to occur most frequently and to be plainest on the legs of the Domestic Ass during early youth, as is apparently likewise the case with the Horse. The shoulder-stripe, which is so eminently characteristic of the species, is nevertheless variable in breadth, length, and manner of termination. I have measured a shoulder-stripe four times as broad as another, and some more than twice as long as others. In one light-grey Ass the shoulder-stripe was only six inches in length and as thin as a piece of string; and in another animal of the same colour there was only a dusky shade representing a stripe. I have heard of three white Asses—not albinoes—with no trace of shoulder or spinal stripes, and I have seen nine other Asses with no shoulder-stripe, and some of them had no spinal-stripe. Three of the nine were light greys, one a dark grey, another grey passing into reddish roan, and the others were brown, two being tinted on

DOMESTIC ASS.

parts of their bodies with a reddish or bay shade. Hence we may conclude that if grey and reddish-brown Asses had been steadily selected and bred from, the shoulder-stripe would have been almost as generally and as completely lost as in the case of the Horse.

"The shoulder-stripe on the Ass is sometimes double, and Mr. Blyth has seen even three or four parallel stripes. I have observed in ten cases shoulder-stripes abruptly truncated at the lower end, with the anterior angle produced into a tapering point, precisely as has been figured in the Dun Devonshire Pony. I have seen three cases of a terminal portion abruptly and angularly bent, and two cases of a distinct, though slight, forking. In Syria, Dr. Hooker and his party observed for me no less than five instances of the shoulder-stripe being plainly forked over the fore leg. In the common Mule it is likewise sometimes forked. When Spist noticed the forking and angular bending of the shoulder-stripe, I had seen enough of the stripes in the various equine species to feel convinced that even a character so unimportant as this had a distinct meaning, and was thus led to attend to the subject. I now find that in the *Asinus Burchellii* and *Quagga*, the stripe which corresponds with the shoulder-stripe of the Ass, as well as some of the stripes on the neck, bifurcate, and that some of those near the shoulder have their extremities angularly bent backwards. The forking and angular bending of the stripes on the shoulders apparently stand in relation with the changed direction of the nearly upright stripes on the sides of the body and neck to the transverse bars on the legs. Finally, we see that the presence of shoulder- leg- and spinal-stripes in the Horse, their occasional absence in the Ass, the occurrence of double and triple shoulder-stripes in both animals, and the similar manner in which these stripes terminate at their lower extremities, are all cases of analogous variation in the Horse and Ass. These cases are probably not due to similar conditions acting on similar constitutions,

ONAGER.

but to a partial reversion in colour to the common progenitor of these two species, as well as of the other species of the genus."

The Asses, beside the characters above mentioned, have the upper part of the tail covered with short hairs, while the lower part terminates in a long hairy tuft; horny excrescences, or warts, exist on the fore legs alone. In England, as we have before remarked, Asses are small and without much variation, because their points have not been selected. When, however, care is taken in breeding, the result is as remarkable as in the case of the Horse. Near Cordova, according to Mr. Darwin, they are carefully bred, as much as two hundred pounds having been paid for a stallion Ass. Asses from Spain, Malta, and France have been introduced into Kentucky for the breeding of Mules, which have been raised by the care of the Kentuckians from their original size of fourteen hands to sixteen hands in height. Great prices are put on these splendid animals, one of great celebrity having been sold for over one thousand pounds. At their cattle shows, one day is given up to the exhibition of Asses.

WILD ASS OF ABYSSINIA.

Asses have always been in repute in the East, and much pains have been taken in their breeding. They are frequently mentioned in the Bible, from which it appears that white Asses were used by people of high rank, as may be seen from the following verse (Judges v. 10): "Speak, ye that ride on white Asses, ye that sit in judgment, and walk by the way."

THE MULE AND HINNY.—The hybrid offspring of the Ass and the Mare is the Mule; while the Hinny is that of the Horse and female Ass. Of these the Mule is by far the larger, taking more the form and appearance, as well as the dimensions, of the mare; while the latter assumes so much of the nature and general appearance of the Ass as to render the breeding of it undeserving of attention.

THE WILD ASS OF TIBET.—We are indebted to Dr. Sclater, the accomplished Secretary of the Zoological Society of London, for an interesting account of the various species of Wild Asses. The Kiang, or Wild Ass of Tibet, inhabits the high plateaux, at no less an altitude than from fifteen to sixteen thousand feet above the sea. It is a large animal, measuring fourteen hands in

ZEBRAS.

height, and is exceedingly swift and wary. The back is marked by a broad black line, but there is no transverse bar across the shoulders; it is probably the true *Equus hemionus* of Pallas. (See figure, p. 295.)

The Onager, or Wild Ass of the Asiatic deserts, presents several varieties. That variety which inhabits Cutch and Scinde is remarkable for its swiftness and difficulty of approach. It is closely allied to the Wild Ass of Assyria, named by St. Hilaire *Equus hemippus.* (See figure, p. 311.)

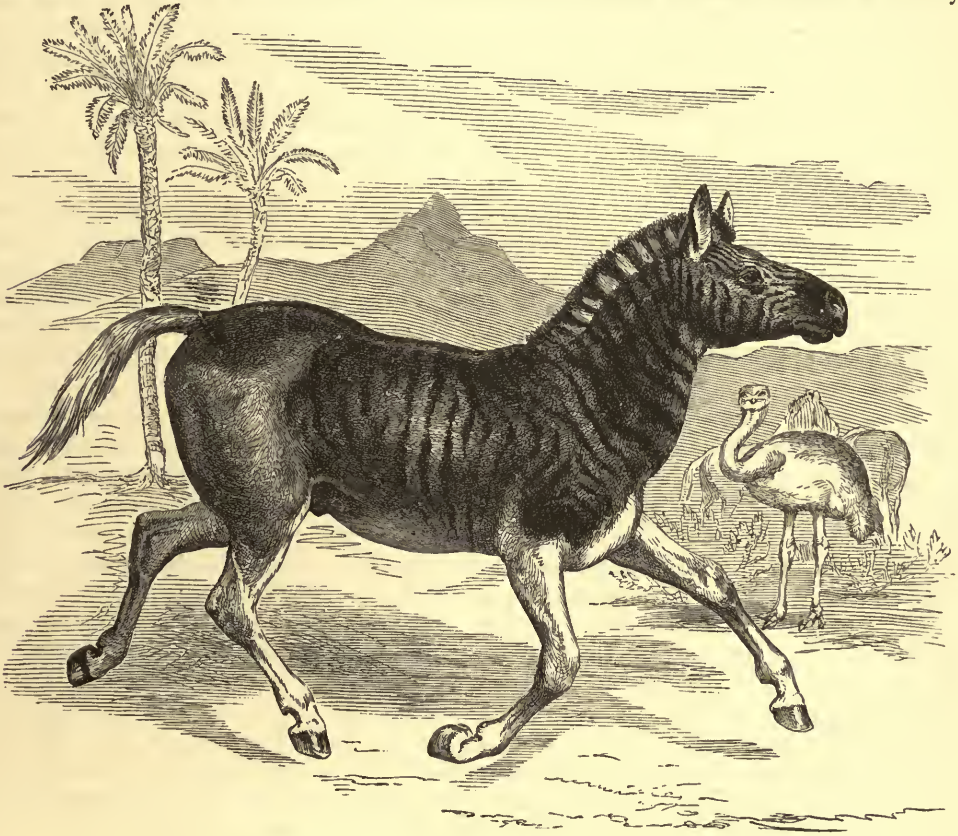
BURCHELL'S ZEBRA.

The Wild Ass of Abyssinia, the parent form from which the domestic animals were derived, is readily distinguishable from the above species by the stripes on its hind legs. (See figure, p. 312.)

The Zebras.—Dr. Sclater describes three species of Zebra: the black and white, or true Zebra, which inhabits the mountains; Burchell's Zebra, or the black and yellow Zebra, which inhabits the plains; and the Quagga. The true Zebra inhabits the hilly districts of Southern Africa, and is remarkable for its beauty and its fierce and untamable nature. It is by far the most conspicuous and most beautiful of the Ass tribe. The stripes which define it from the ordinary Asses are remarkably like those of the Tiger in their arrangement. Those on its legs are horizontal, while those of its body are for the most part vertical.

Burchell's Zebra is found in great numbers north of the Orange River; and, according to Sir Cornwallis Harris, "seldom congregating in herds of fewer than eighty or a hundred, it abounds to a great extent in all the districts included between that noble stream and the southern tropic. Occupying the same regions and delighting in the same pastures as the Brindled Gnu, rarely is it to be seen unless in the companionship of that fantastic animal, whose presence would seem to be almost indispensable to its happiness. It is singular enough that the members of two families so perfectly foreign to each other should display so great a predilection for each other's society, uniformly intermixing as they do, and herding in bonds of the closest friendship. Fierce, strong, fleet, and surpassingly beautiful, there is, perhaps, no quadruped in the creation, not even excepting the Mountain Zebra, more splendidly attired, or presenting a picture of more singularly attractive beauty, than this free-born child of the desert."

The QUAGGA, which is less attractively coloured, and inhabits a different tract of country, is also described by Sir Cornwallis Harris, as follows:—"The geographical range of the Quagga does not appear to extend to the northward of the river Vaal. The animal was formerly extremely common within the colony; but, vanishing before the strides of civilisation, is now to be found in very limited numbers, and on the borders only. Beyond, on those sultry plains which are completely taken possession of by wild beasts, and may with strict propriety be termed the domains of savage nature, it occurs in interminable herds; and, although never intermixing with its more elegant congeners, it is almost invariably to be found ranging with the White-tailed Gnu and with the Ostrich, for the society of which bird especially it evinces the most singular predilection. Moving slowly across the profile of the ocean-like horizon, uttering a shrill, barking neigh, of which its name forms a correct imitation, long files of Quaggas continually remind the early traveller of a rival caravan on its march. . . . Bands of many hundreds are thus frequently seen during their migration from the dreary and desolate plains of some portion of the interior, which has formed their secluded abode, seeking for those more luxuriant pastures where, during the summer months, various herbs thrust forth their leaves and flowers to form a green carpet, spangled with hues the most brilliant and diversified."


QUAGGA.

THE FOSSIL EQUIDÆ.

The living members of the family of Horses are, as we have seen, restricted to the region of the Old World, and were unknown in the Americas and in Australia, when those countries were first discovered. From an examination, however, of their fossil remains, it is evident that in the Pliocene and Pleistocene times Horses were widely distributed in both North and South America. The bones and teeth in caves and river deposits of Europe also show that Wild Horses were very numerous in Europe in the latter age. We are even able to form an accurate idea of the European Wild Horse from the engravings which the ancient hunters of Reindeer have left behind in caves of Auvergne, Switzerland, and Derbyshire. The outline engraved on a bit of bone or a fragment of antler shows us an animal with a large head, thick neck, and big mane, coarse and clumsy in its points, as might be expected from an aboriginal wild breed not subject to the care and selection of man. The Horse, like the Bison and the Reindeer, formed a large part of the food of these ancient men of the caves, and was not domesticated. The true Horses begin to appear in Europe in the later Pliocene strata.

In the early Pliocene and late Miocene ages the family of Horses is represented by the HIPPARION, a small, slender, graceful animal, possessed of three well-defined toes, bearing hoofs, on each limb: one strong and large in the middle, while the two lateral toes are so small that they do not extend beyond the fetlock. They may be compared to dew-claws. The teeth are like those of the Horse, but shorter, and the pattern of the enamel on the grinding surface is more complicated. In the early Miocene and late Eocene the ANCHITHERIUM appears. Its orbit is not so completely encircled with bone as in the Horses and Hipparion.

"The shaft of the ulna," writes Professor Huxley, "is stouter than in Hipparion, and is less closely united with the radius. The fibula appears—at any rate, in some cases—to have been a complete though slender bone, the distal end of which is still closely united with the tibia, though much more distinct than in the Hipparions and Horses. In some specimens, however, the middle of the shaft seems to have been incompletely ossified. Not only are there three toes in each foot, as in Hipparion, but the inner and the outer toes are so large that they must have rested upon the ground. Thus, so far as the limbs are concerned, the Anchitherium is just such a step beyond the Hipparion as the Hipparion is beyond the Horse, in the direction of a less specialised quadruped. The teeth are still more divergent from the Equine type. The incisors are smaller in proportion, and their crowns lack the peculiar pit which characterises those of Equus and Hipparion. The first grinder is proportionally much larger, especially in the upper jaw, and, like the other six, has a short crown and no thick coat of cement. The pattern of their crowns is wonderfully simplified. The fore and hind ridges run with but a short obliquity across the crown, and the pillars are little more than enlargements of the ridges, while in the lower jaw these pillars have almost entirely disappeared. But the foremost of the six principal grinders is still somewhat larger than the rest, and the posterior lobe of the last lower molar is small, as in the other Equidæ."

In all those respects in which Anchitherium departs from the modern Equine type it approaches that of the extinct *Palæotheria;* and this is so much the case that Cuvier considered the remains of the Anchitherium, with which he was acquainted, to be those of a species of Palæotherium. From these considerations it may be concluded that the highly specialised Horse has obtained its characteristics by descent from the Hipparion, and that again from the Anchitherium. In some cases on record there is a reversion towards the ancestral type, Horses having been born with tridactyle feet, similar in every respect to those of the Hipparion.

The lineage of the Horse is traceable yet further back by the discoveries of Marsh and Cope in New Mexico, Wyoming, and Utah, in North America, up to the Eohippus of the Lower Eocene, a small animal not larger than a Fox, and with three toes on the hind foot and four and a rudiment of a fifth on the fore foot. It must further be noted that the fossil Horses increased in size as they lost their toes, and that the living Horse is the biggest of the family.

CHAPTER II.

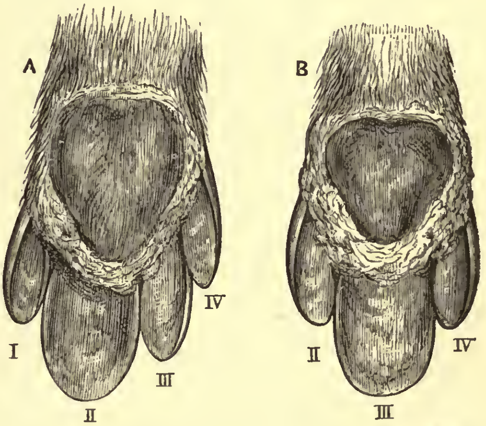
PERISSODACTYLA—THE TAPIR AND RHINOCEROS FAMILIES.

Introductory Remarks on the Tapirs—Foot—Anatomical Features—Skull—Compared with that of Hog—Skull of Asiatic Tapir—Proboscis—Dentition—Species of Tapir—THE AMERICAN TAPIR—Habits—Colour—Modes of Hunting—Docility—THE HAIRY TAPIR—THE MALAYAN TAPIR—FOSSIL TAPIRS—THE RHINOCEROSES—General Characteristics—Is it the Reèm of the Bible?—Ludicrous Ideas respecting it—At Rome—First Rhinoceroses in Europe—Skeleton—Skull—Horns—Curious Dental Law—Fore and Hind Limbs—Dentition—AFRICAN RHINOCEROSES—"WHITE" RHINOCEROS—OSWELL'S RHINOCEROS—BLACK RHINOCEROS—KEITLOA—RHINOCEROS BICORNIS MINOR—Hunting—Sir Samuel Baker's Extraordinary Chase—Gordon Cumming's Account of the Characteristics and Habits of the Black and White South African Rhinoceroses—Rhinoceros Birds—THE ASIATIC RHINOCEROSES—Connection between Dentition and Horns—THE INDIAN RHINOCEROS—An Inveterate Enemy of the Elephant—THE JAVAN RHINOCEROS—THE SUMATRAN RHINOCEROS—THE HAIRY-EARED RHINOCEROS—How a Specimen, "Begum," was Captured—THE FOSSIL RHINOCEROSES—The Extinct Families Palæotheridæ and Macraucheniadæ.

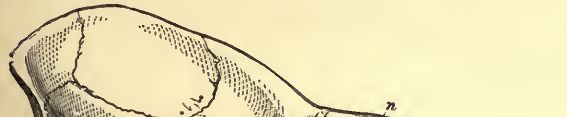
II.—THE TAPIRIDÆ (FAMILY OF TAPIRS).

THE Hog-like creatures which constitute the family of Tapirs form the second division of the quadrupeds which are possessed of three toes on their hind feet, and are therefore termed, as has already been said, the Perissodactyla. It must not, however, be forgotten that these creatures possess a fourth toe on the fore foot, which is small and does not reach to the ground. The family is represented by one genus only—*Tapirus*—which is distributed over wide regions in the warmer parts of the Old and the New Worlds. All the animals comprised under it possess short and movable trunks, by which they convey their food into their mouths, and at the extremity of which are placed the nostrils. They are of a brownish-black colour; the skin is hairy and extremely thick, and the tail is very short.

The Tapir inhabits principally the inmost recesses of dense forests, is nocturnal in its habits, and is phytophagous, that is, feeds on vegetables. However, it is said that it is also an indiscriminate swallower of everything, filthy or clean, nutritious or otherwise, pieces of wood, clay, pebbles, and bones being not uncommonly found in its stomach; and it is even stated of one that was kept in confinement that it gnawed a silver snuff-box to pieces and swallowed the contents.



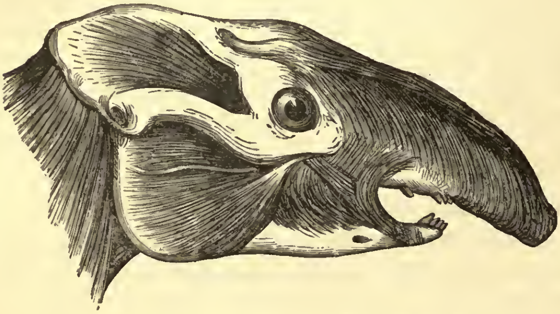
FORE (A) AND HIND (B) FOOT OF TAPIR. (*After Murie.*)



SKULL OF AMERICAN TAPIR.
n, Nasal Bone; *m*, Maxillary Bone; *pm*, Pre-maxillary Bone.

The skull of the Tapir, seen in profile, reminds us strongly of that of the Hog, the same pyramidal elevation being brought to view. Examined closely, however, we find that this pyramid differs immediately from that of the latter animal by the possession of only three faces, while in the Pig there are four. In addition, it is also to be noticed that the anterior line is formed by the joining of the lateral faces, dilating into a triangle only towards the front: this being due to the frontal bones, which are early united and directed somewhat backwards. The bones of the nose are articulated to the base of the triangle, and here there is a point which penetrates between them. A deep furrow, produced by the upper border of the orbit, descends from the two sides above the orbit, which, approaching the sub-orbital hole, serves for the insertion of various muscles connected with the proboscis. With regard to the differences between the skull of the Malayan Tapir and the

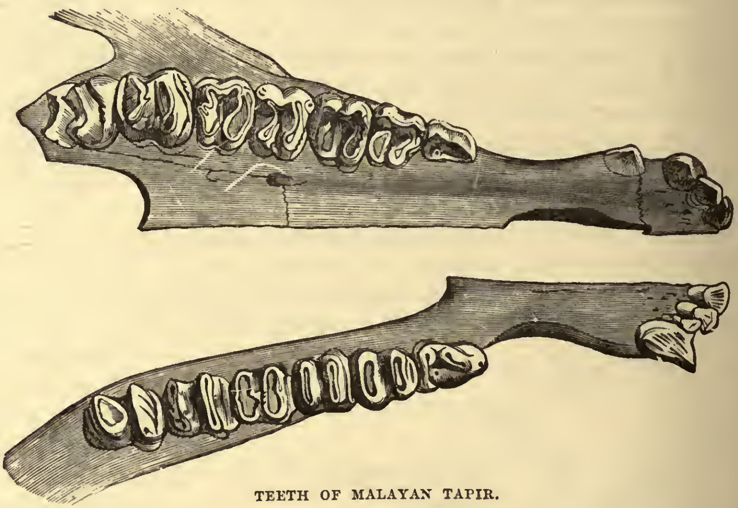
American, Cuvier observes that a glance at the profile of their respective crania is sufficient to impress upon the observer their specific differences. The forehead of the Indian Tapir is convex, and rises higher than the back of the head. It is accompanied, in its rise, by the nasal bones, an arrangement by which space is given for the comparatively large proboscis, and adding length to the furrows where the muscles are inserted. This organisation, according to Cuvier, explains why the Indian Tapir has a more powerful and more extensile trunk than the American. There is also in the former, on the base of the nasal bones, at their junction with the frontal bones and on each side, a deep fossa, or depression, which does not exist in the other species. This elevation of the forehead is accompanied by a depression of the occipital crest, which, far from forming a pyramid, as in the American species, rather descends backwards. The aperture of the bony nostrils, enlarged by the prolongation of the maxillary bones, terminates below and forwards by more elevated premaxillaries, which are fused (anchylosed) together in early youth, as in the American.



HEAD OF MALAYAN TAPIR, SHOWING MUSCLES OF SHORT TRUNK AND FACE. (*After Murie.*)

In the upper jaw there are, in the adult Tapir, on each side three incisors, one canine, four premolars, and three molars. In the lower jaw, on each side, there are three incisors, one canine, three premolars, and three molars: altogether making forty-two teeth in number.

Some peculiarities offer themselves with regard to the form of the teeth: for instance, the outer incisors above are very large and resemble canines, while those below are unusually small. The canines themselves are very small, having their crowns considerably shorter than their roots.



TEETH OF MALAYAN TAPIR.

With regard to other portions of the skeleton nothing need be remarked, except that the bones of the extremities are exceedingly strong, and resemble in many respects those of the Rhinoceros.

Three species of Tapirs are known, namely, American Tapir (*Tapirus americanus*), Roulin's Tapir (*Tapirus villosus*), and Asiatic Tapir (*Tapirus malayanus*).

The American Tapir.*—Of the three foregoing species the best known is the American Tapir, which is found in almost all parts of South America from Buenos Ayres to Central America, and from the Andes to the Atlantic. In its habits it is nocturnal, spending the whole of the day-time in the cool shades of the densest forests, and coming forth to feed on the surrounding vegetation as evening approaches. It is a most powerful animal, and everything in the underwood of the forest gives way to its rush. It has the habit of making runs or roads through the brushwood, which beaten tracks are usually selected by travellers in passing through the forests. It is stated that it has a most keen

* *Tapirus americanus.*

sense of smell, enabling it to detect its enemies at long distances, when it at once rushes into brushwood or thicket so dense that neither man nor horse can follow. It never attacks man without being very hardly pressed and brought to bay.

AMERICAN TAPIRS.

It is excessively fond of the water, being a most expert swimmer, and usually keeping to a particular track in the element in which it indulges.

The American species is characterised by having the general colour throughout of a deep brown, approaching to black; but the sides of the lower lip, band on the under and middle part of the chin, upper edges of the ears, and naked line at the bottom of the hoofs, are snowy white. The scanty hair of the body is very short, and is hardly to be distinguished at a comparatively short distance.

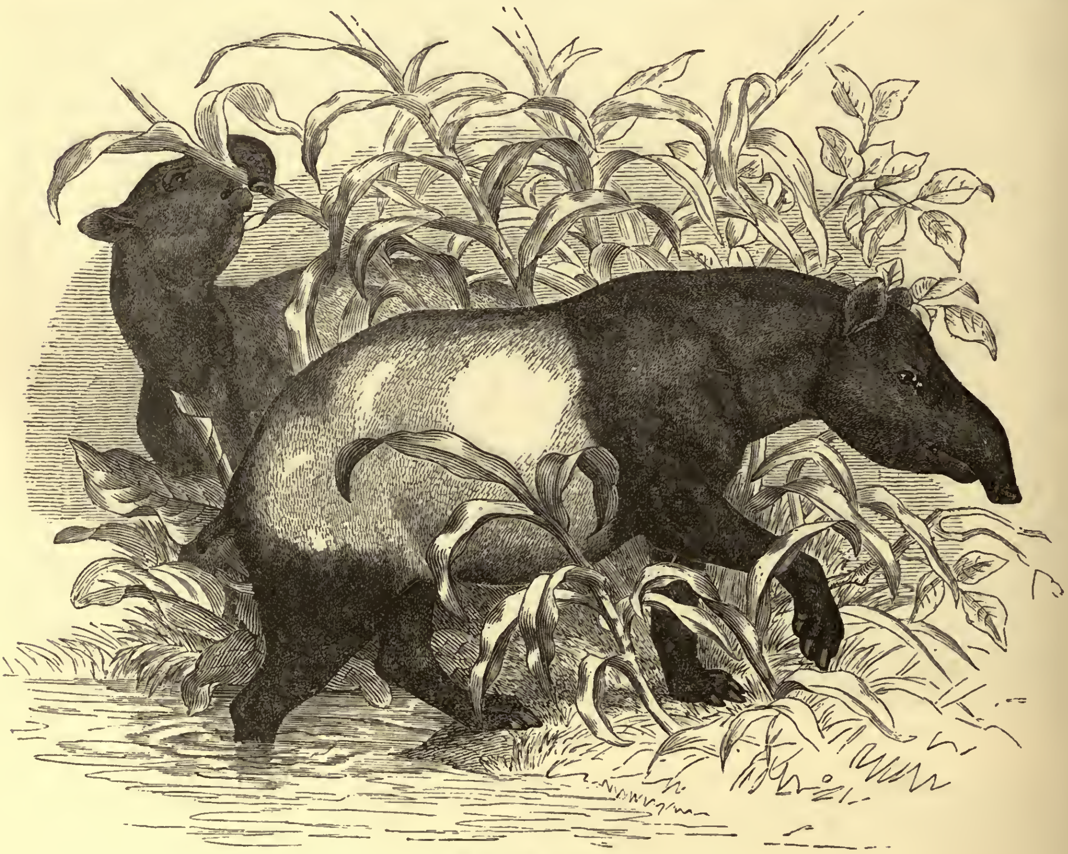
The skin, which is of great density beneath, is described by M. Roulin to be not less than seven lines thick on the back; and he says that in the days when rifles were not brought to their present pitch of perfection a ball from one of them would scarcely make an impression.

On the back of the neck there is a thick rounded crest, which extends from the forehead, as low as the level of the eyes, to the shoulders, and beset with a comparatively thin mane of stiff blackish bristles.

The American Tapir is hunted for its excessively tough hide, and also for its flesh, which, although described by Europeans as unsavoury, being coarse and dry, is considered palatable by the Indians. It is captured sometimes, although not often, by means of the lasso, an instrument so successful in Horse-catching in America, but often futile as regards the Tapir, for its usual haunts render this mode of capture most difficult, and its determined rush and immense strength frequently enable it to break the strongest lasso. Another way of hunting the Tapir practised by the native hunters is to find out the animal's track leading to the water; there, with their Dogs, they patiently lie in wait until evening approaches, when the Tapir comes out for the purpose of taking his evening stroll and indulging in the indispensable bath. They then get between him and the water, when a desperate encounter ensues, the Dogs often getting very badly injured.

The most successful manner of catching the Tapir, however, is by means of imitating its whistle or call, thus bringing the animal within range of the Indian's poisoned arrow.

The American Tapir is spoken of as being mild in captivity and easily domesticated, and tame Tapirs are permitted to run at large in the streets of the towns of Guiana, and often wander



MALAYAN TAPIR.

CALIFORNIA

RHINOCEROS ACCOMPANIED BY RHINOCEROS

into the forests, but return again in the evening to the house in which they are kept and fed. The Tapir is capable of considerable attachment to its owner, and possibly, by care and attention, might be turned to good account, as the qualities with which it is credited—strength, docility, and patience—ought to render it capable of the duties of a beast of burden.

THE HAIRY TAPIR,* the second species of American Tapir, inhabits the inner range of the Cordilleras, this species being strictly mountainous in its habits.

It is stated to differ from the other species of America by not possessing a mane; but has altogether longer hair, and there are no wrinkles on the proboscis. In the conformation of the skull and general characteristics it more nearly resembles the Asiatic Tapir than the American, and is less common than the latter animal.

THE MALAYAN TAPIR.†—The Asiatic Tapir, which appears to have become known to Europeans only in the present century—at least, the first certain information of it reached Europe in the year 1816—is an inhabitant of Sumatra, Malacca, and the south-west provinces of China. It is said to have been found also in Borneo. In size it is larger than either *T. americanus* or *T. villosus.* It is distinguished by the absence of a mane, the general colour of the hair being glossy black, but with the back, rump, and sides of the belly white.

In its habits the Asiatic Tapir appears to be similar to his American cousin, and in captivity it is said to be of a most mild and inoffensive disposition, becoming as tractable and familiar as a Dog.

FOSSIL TAPIRS.—The living Tapir is known at the present day only in the warmer regions of the New and Old Worlds, in South America, and in the East. In the Pleistocene Age, however, it is proved to have ranged far up the valley of the Mississippi in the United States. In the Miocene and Pliocene Ages the animal inhabited Europe, and its fossil teeth are met with by no means unfrequently in the Crag deposits of Norfolk and Suffolk. The *Lophiodon* of the European and American Eocenes is also a closely allied form.

III.—THE RHINOCEROS FAMILY (RHINOCEROTIDÆ).

The Rhinoceroses form the third family of the sub-order of Perissodactyla. They are to be found in Africa south of the Sahara Desert, and in Eastern Asia—in India, Java, and Sumatra, &c., where the climate is tropical or sub-tropical. They are represented by several living species, as well as by several extinct forms which ranged, in the later Tertiary times, over nearly the whole of Europe and Northern Asia. The principal characters which are to be observed in the Rhinoceros are the large unwieldy bodies, supported on short, stout legs, terminating in a large callous pad with hoof-bearing toes, the large and long head, the small eyes and ears, and the short tail. All the living species also possess one or two horns, which are placed in the middle line of the head on and above the nose. The horns are to be viewed as a mere appendage to the skin, like hair, for they are only skin deep, and are composed of a series of fibres matted together, and are essentially a mass of hair in which each hair is confluent with those next to it. Horns were present also in all the fossil species excepting one, the Aceratherium, the hornless Rhinoceros of the Miocene Age. The skin in all the Rhinoceroses is very thick, and is converted into a jointed armour in some of the Asiatic species; it is also scantily covered with hair, except in "the Hairy-eared Rhinoceros." A fossil kind was woolly.

It is a disputed point whether the word Reèm, mentioned several times in the Bible, and translated in the authorised version as Unicorn, is the Rhinoceros or the Urus; the probability seems to be that the latter is intended. The first time Reèm is mentioned in the Bible is in Numbers xxiii. verses 21, 22, to the following effect:—"The Lord his God is with him, and the shout of a king is among them. God brought them out of Egypt; he hath as it were the strength of Reèm." Whatever animal Reèm may have been, it was a creature evidently of great power, and the strongest known to the prophet. In another passage—Deut. xxxiii. verses 16, 17—we obtain the information that Reèm was a two-horned and not a one-horned animal, and therefore could not possibly have been the Indian Rhinoceros at least, and that it is mentioned at the same time with Bullocks. Other passages speak of Reëm in connection with the plough and harrow, for which its tameless and savage disposition rendered it unfit. It is also spoken of in Isaiah in connection with sacrifices of cattle (chap. xxxiv. verses 6, 7).

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* *Tapirus villosus.*

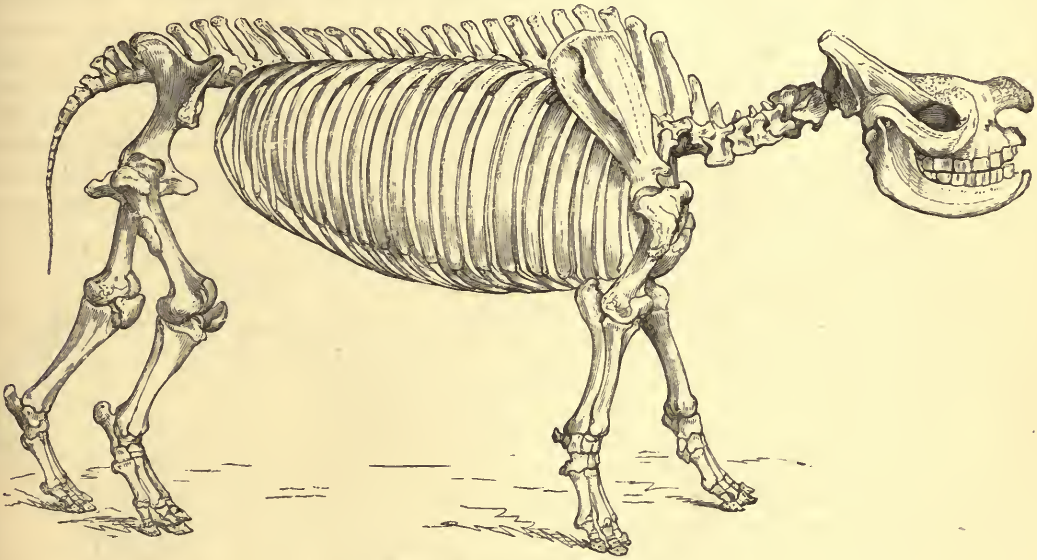
† *Tapirus malayanus.*

Topsel, an author of the sixteenth century, while trying to show that there lived such a creature as the fabled Unicorn, and giving a picture representing it as possessing the horn of the Narwhal, the body of a Horse, and the feet of an Ox, successfully shows Reëm to mean neither a Unicorn nor Rhinoceros, but simply an Ox. He relates :—"That there is such a beast the Scripture itself witnesseth, for David thus speaketh in the 92nd Psalm : *Et erigetur cornu meum tanquam monocerotis* —that is, my horne shall bee lifteth up as the horne of a unicorn." He goes on to say : "We have already shown, in the story of the Rhinoceros, that Reëm in Hebrew signifies a Unicorne, although Munster be of another opinion ; yet the Septuagints, in the translation of Deut. xxxiii., do translate it a Unicorne, for the Rhinoceros hath not one horne but two. Rabbi Solomon, David Kimchi, and Saadius do always take Reëm and Karas for a Unicorne, and they derive Reëm from Rom, which signifieth *Altitudinem*, height, because the horne of the Unicorn is lifted up upon high. Hereunto the Arabians agree, which call it *Barkeron*, and the Persians *Bark ;* the Chaldeans, *Remana.* In the 39th chapter of Job the Lord speaketh in this manner to Job :—'Will the Unicorne rest and serve thee, or tarry beside thy cratches ? Canst thou bind the Unicorne with a halter to thy plough to make furrows ? or will he make plaine the clots of the valleys ?' . . . Whereby God Himself must needs be traduced if there be no Unicorne in the world." We may therefore conclude that Reëm was one of the Oxen wild in those times in Palestine. It, probably, was the great wild Ox, or Urus, which formerly abounded in the forests of Macedonia, and was hunted in the forests of Germany as late as the tenth century after Christ.

The Rhinoceros was first seen at Rome, according to Pliny, in the games given by Pompey to the Roman people. He describes it as being possessed of one horn on its nose, which it sharpens on a stone before it fights, and that when it fights with the Elephant it attempts to rip its belly open. The earliest time the animal was mentioned by name was by Agatharchides, who describes it as fighting in the manner above alluded to. In both these instances it is evident that the one-horned Asiatic species is meant. The African Rhinoceros, according to Dion Cassius, was for the first time brought before the notice of the Romans in B.C. 39, in the games given by Augustus to celebrate his victory over Cleopatra. It was exhibited along with a Hippopotamus, and both animals were in all likelihood obtained from the Upper Nile.

Probably the first Rhinoceros ever seen by modern Europeans was a one-horned species, the *R. unicornis*, sent from India to Emanuel, King of Portugal, in 1513. A sketch was sent from Lisbon to Nürnberg, and a most extraordinary engraving was made by Albert Dürer, from which Gesner, Topsel, &c., took copies. This animal was made to appear in a wonderful suit of armour beautifully decorated, and supplied with a second horn on the shoulders, resembling the point of that of the Narwhal. Topsel's description of the Rhinoceros is most ludicrous—"First of all, that there is such a beast in the world both Pliny, Solinus, Diodorus, Ælianus, Lampridius, and others, doe yeald erefrigable testimony." He then goes on to say : "The picture here expressed was taken by Gesner from the beast alive at Lisbon, in Portugale. . . . Eucherius saith that the Rhinoceros hath two hornes in his nose, but that is utterly false, as you may see by the picture. . . . The Rhinoceros cast up a Beare into the aire even as a Bull would do a ball which were laid upon his two hornes ; we shall not neede to apply *Gemino cornu* to the Bull, as Politianus doth, but rather take it figuratively for a strong horne, and if it must needs be litterall, it is apparent by the picture that there is another little horne, not upon the nose, but upon the wither of the beast. . . . When they are to fight they whet their horne upon a stone ; and there is not only a discord betwixt these beasts and Elephants for their food, but a naturall description and enmity : for it is confidently affirmed that when the Rhinoceros which was at Lisbone was brought into the presence of an Elephant, the Elephant ran away from him. . . Hee (the Rhinoceros) is taken by the same means that the Unicorn is taken, for it is said by Albertus, Isidorus, and Alumnus, that above all other creatures they love virgins, and that unto them they will come, be they never so wilde, and fall asleep before them, so being asleep they are easily taken and carried away." Topsel then goes on to inform us that "all the later physicians attribute the virtue of the Unicorn's horne to the Rhinoceros's horn, but they are deceived by imitation of Isidorus and Albertus, for there is none of the ancient Græcians that have ever observed any medicines in the Rhinoceros. The Indians made bottles of their skins, wherein they put their lycion, or *succum medicatum.*"

The first Rhinoceros brought alive to England was in 1685, and another was shown throughout a great part of Europe in 1739, and another in 1741. Parsons* described and figured the Rhinoceros of 1739, and refers to that of 1741, which Cuvier says he believes to be the same animal afterwards shown in Paris in 1749, painted by Oudry, and afterwards engraved by Edwards and figured by Albinus. It was the one described by Daubenton, as well as by Meckel. The one of which Cuvier gives the osteology was the fifth brought to Europe. It arrived at Versailles in 1771, and died in 1793, at the age of about twenty-six years. Another Rhinoceros arrived from the East Indies in 1790, as a present to Mr. Dundas. This was afterwards purchased for £700, and exhibited at Exeter 'Change and also about England generally. Another animal, which was destined for the menagerie of the Emperor of Germany, arrived from India in 1800, but died in London soon after its arrival. It was dissected by Mr. Thomas, and his observations thereon were published in the "Philosophical Transactions." Shortly afterwards an eighth arrived, which subsequently went to Germany. Since this it has become common in the Zoological Gardens in various parts of Europe, and, in 1878, the genus was represented in the Regent's Park by no less than five different species and varieties.



SKELETON OF THE RHINOCEROS.

The skeleton of the Rhinoceros, viewed generally, has a resemblance to that of the little Hyrax, the Tapir, and the Horse. The skull is much elevated at the base, being somewhat of a pyramidal form, and the nasal bones curve upwards and downwards, and are of such a size and thickness, in order to support one or more immense horns, that they are quite unparalleled for their development in any other existing quadruped. The nasal bones, together with the pre-maxillary and maxillary bones, form the general contour for the external apertures of the nostrils. This is peculiar, and found in no other animal, with the exception of the Tapir.

The Rhinoceros has no canine teeth; the incisor teeth vary, not only in regard to their form and proportions, but also their existence; and in the varieties of these teeth we may discern the same inverse relation to the development of the horns which is manifested by the canines of the Ruminants. Thus, the two-horned Rhinoceroses of Africa, which are remarkable for the great length of one or both of the nasal weapons, have no incisors in their adult dentition; neither had the great extinct hairy species (*Rhinoceros tichorhinus*), though that the latter had great horns is proved by the nature of the bones of the nose and face which supported their weight. The Sumatran bicorn Rhinoceros combines, with comparatively small horns, moderately developed incisors in both jaws.

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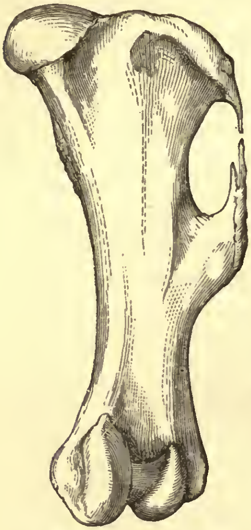
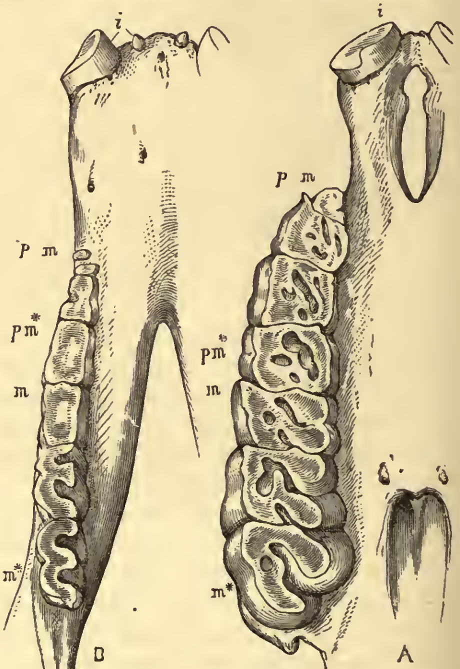
* *Philosophical Transactions*, xlii.


FEMUR OF RHINOCEROS.

The sternum of the mature animal consists of four bones, the first of which is compressed into a ploughshare-like shape, and projects in a point in front of the first rib. All the bones of the fore limbs of the Rhinoceros resemble those of the Tapir more than those of any other animal; but from their much larger size are not at all likely to be confounded with them. Of the hind limbs, the points offering peculiarities are as follows:—The femur is remarkable for being extremely flattened from before backwards, and the projection called by Cuvier the third trochanter projects very much, forming a hook ascending towards a hook which descends from the projection known as the grand trochanter, thereby leaving an oval hole between these two projections. With regard to the lower portions of the hind leg, resemblances are to be found both to the Horse and Tapir, the tibia, fibula, and tarsus being built on the same plan as those of the former, although some of the bones of the tarsus resemble those of the Tapir more than they do those of the Horse. There are also some points of resemblance in the metatarsus to that of both the Horse and Tapir. The difference between the hind legs of the Rhinoceros and Elephant is very marked, and their gait is different.

The dentition of the Rhinoceros differs in a very remarkable degree from that of the family of Horses. The grinders are implanted by distinct roots, and in the upper jaw their crowns are traversed by two deep folds of enamel, which constitute open valleys. In the lower jaw they are composed of two crescent-shaped lobes, also open. The covering of "cement" is thin, and never fills up the valleys, as in the case of the more complex dental system in the Horse. The normal number of the grinders is seven in each jaw, while the incisors, as we have already remarked, vary, not only in form, but also are sometimes absent, and canines are not developed in any of the living or fossil members of the family.



DENTITION OF RHINOCEROS. A, UPPER; B, LOWER JAW.

THE AFRICAN RHINOCEROSES.

Of the number of species of Rhinoceros there is considerable doubt. At least four, possibly five, inhabit Africa, and four Asia. With regard to the African species, we will first take the large "White" Rhinoceros (*Rhinoceros simus*) described by Burchell. This is an animal measuring somewhat over twelve feet in length and about five feet ten inches in height. It has a square nose and two large rounded horns, the anterior one averaging about two feet six inches in length, but not uncommonly found measuring three feet six inches, sometimes even over four feet; the posterior rarely or never exceeding fifteen inches, and generally not being more than twelve inches. Its skin is smooth, and without any of those folds so characteristic of the Asiatic species. It inhabits all the country south of the Zambesi, and probably it may also exist in Central Africa. It feeds solely on grass, and sometimes collects into small herds.

Oswell's Rhinoceros* in no way differs from *R. simus*, except that the front horn points forwards, and in some cases even downwards. This Mr. Drummond considers not to be a distinct species, but only an accidental and local variety.

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* *Rhinoceros Oswellii.*

The so-called Black Rhinoceros (*Rhinoceros bicornis major*) is a much smaller animal than *R. simus*, being about eleven feet in length and five feet in height, with an elongated head and horns thicker in proportion to length than those of *R. simus*. The front horn is twenty inches or twenty-two inches in length, and never attains to more than twenty-six or twenty-eight inches; while the back horn averages ten inches or twelve inches. Its skin is not black, but flesh-coloured, and the upper lip is highly prehensile. The first specimen ever brought to Europe was captured in Upper Nubia in 1868, and was provided with a lodging in the Regent's Park Zoological Gardens. It is found in all the country south of the Zambesi; inhabits thorn thickets chiefly (in which *R. simus* is never found), but occasionally occurs in other jungle or open ground. It feeds chiefly on thorn leaves and branches, though also eating grass, for the plucking of which its flexible upper lip is as well fitted as the long tongue of the Giraffe. It is gregarious, five or six being sometimes found together.

"WHITE" RHINOCEROS.

The Keitloa, or Sloan's Rhinoceros (*Rhinoceros keitloa*), differs but little from *R. bicornis major*, excepting in the formation of the head, which is somewhat shorter and broader, and it has a less prehensile lip. Its chief characteristic is the posterior horn, which is flattened at the sides, being of almost equal length to the anterior, and even occasionally longer, twenty inches and twenty-two inches being about the average. It is found sparingly in all the country south of the Zambesi, and is not gregarious, a bull and cow only being usually seen together. RHINOCEROS BICORNIS MINOR is the smallest, being seldom over ten feet in length, or more than four feet ten inches in height. The head is more elongated and the nose more prehensile than in any other species, while the legs are shorter in proportion and the feet smaller. The anterior horns rarely exceed twelve inches, and the posterior seven or eight inches. It is usually found only between Zululand and the Limpopo river, although it has been killed farther north, not far from the Zambesi. It is not gregarious, two full-grown ones and a calf being the greatest number that has been recorded as seen together. It feeds on thorns, leaves, and shoots, and rarely, if ever, is found out of the thorn jungle.

KEITLOA.

Until recent times, it was universally believed that the hide of a Rhinoceros was too tough to allow a bullet to penetrate; indeed, even now in popular opinion the belief is still retained, but, like many popular opinions, it has been proved to be untrue; and that a Rhinoceros may be as easily shot with an ordinary bullet as an Ox is fully established on the authority of Gordon Cumming, Sir S. Baker, Dr. Livingstone, and others.

Sir S. Baker, in his "Nile Tributaries," gives the following interesting account of a Rhinoceros hunt :—"We were leisurely returning home through alternate plains and low open forests of mimosa when Taher Sheriff, who was leading the party, suddenly reined up his Horse, and pointed to a thick bush, beneath which was a large, grey, but shapeless mass. He whispered, as I drew near, 'Oom qurrin' (mother of the horn), their name for the Rhinoceros. I immediately dismounted, and with the short No. 10 Tatham rifle I advanced as near as I could, followed by Suleiman, as I had sent all my gun-bearers direct home by the river when we had commenced our circuit. As I drew near, I discovered two Rhinoceroses asleep beneath a thick mass of bushes; they were lying like Pigs, close together, so that at a distance I had been unable to distinguish any exact form. It was an awkward place; if I were to take the wind fairly, I should have to fire through the thick bush, which would be useless; therefore I was compelled to advance with the wind direct from me to them. The aggageers remained about a hundred yards distant, while I told Suleiman to return, and hold my Horse in readiness with his own. I then walked quietly to within about thirty yards of the Rhinoceroses, but so curiously were they lying that it was useless to attempt a shot. In their happy dreams they must have been suddenly disturbed by the scent of an enemy, for, without the least warning, they suddenly sprang to their feet with astonishing quickness, and with a loud and sharp whiff, whiff, whiff! one of them charged straight at me. I fired my right-hand barrel in his throat, as it was useless to aim at the head, protected by two horns at the nose. This turned him, but had no other effect, and the two animals thundered off together at a tremendous pace. Now for a 'tally ho!' Our stock of gum was scattered on the ground, and away went the aggageers in full speed after the two Rhinoceroses. Without waiting to re-load, I quickly remounted my Horse Tétel, and, with Suleiman in company, I spurred hard to overtake the flying Arabs. Tétel was a good strong cob, but not very fast; however, I believe he never went so well as upon that day, for, although an Abyssinian Horse, I had a pair of English spurs, which worked like missionaries, but with a more decided result. The ground was awkward for riding at full speed, as it was an open forest of mimosas, which, although wide apart, were very difficult to avoid, owing to the low crowns of spreading branches; these, being armed with fish-hook thorns, would have been serious on a collision. I kept the party in view until, in about a mile, we arrived upon open ground. Here I again applied the spurs, and by degrees I crept up, always gaining, until I at length joined the aggageers. Here was a sight to drive a hunter! The two Rhinoceroses were running neck and neck, like a pair of Horses in harness, but bounding along at tremendous speed within ten yards of the leading Hamram. This was Taher Sheriff, who, with his sword drawn and his long hair flying wildly behind him, urged his Horse forward in the race, amid a cloud of dust raised by the two huge but active beasts, that tried every sinew of the Horses. Rodur Sheriff, with the withered arm, was second; with the reins hung upon the hawk-like claw that was all that remained of a hand, but with his naked sword grasped in his right, he kept close to his brother, ready to second his blow. Abou Do was third; his hair flying in the wind, his heels dashing against the flanks of his Horse, to which he shouted in his excitement to urge him to the front, while he leant forward with his long sword, in the wild energy of the moment, as though hoping to reach the game against all possibility. Now for the spurs! and as these, vigorously applied, screwed an extra stride out of Tétel, I soon found myself in the ruck of men, horses, and drawn swords. There were seven of us, and passing Abou Do, whose face wore an expression of agony at finding that his Horse was failing, I quickly obtained a place between the two brothers, Taher and Rodur Sheriff. There had been a jealousy between the two parties of aggageers, and each was striving to outdo the other; thus Abou Do was driven almost to madness at the superiority of Taher's Horse, while the latter, who was the renowned hunter of the tribe, was determined that his sword should be the first to taste blood. I tried to pass the Rhinoceros on my left, so as to fire close into the shoulder my remaining barrel with my right hand, but it was impossible to overtake the animals, who bounded along with undiminished speed. With the greatest exertion of man and horses, we could only retain our position within about three or four yards of their tails—just out of reach of the swords. The only chance in the race was to hold the pace until the Rhinoceroses should begin to flag. The Horses were pressed to the utmost; but we had already run about two miles, and the game showed no signs of giving in. On

THE RHINOCEROS HUNT.

they flew—sometimes over open ground, then through low bush, which tried the Horses severely; then through strips of open forest, until at length the party began to tail off, and only a select few kept their places. We arrived at the summit of a ridge, from which the ground sloped in a gentle inclination for about a mile towards the river; at the foot of this incline was thick, thorny, *nabbuk* jungle, for which impenetrable covert the Rhinoceroses pressed at their utmost speed. Never was there better ground for the finish of a race; the earth was sandy, but firm, and as we saw the winning post in the jungle that must terminate the hunt, we redoubled our exertions to close with the unflagging game. Suleiman's Horse gave in—we had been for about twenty minutes at a killing pace. Tétel, although not a fast Horse, was good for a distance, and we now proved his power of endurance, as I was riding at least two stone heavier than any of the party. Only four of the seven remained; and we swept down the incline, Taher Sheriff still leading, and Abou Do the last! His Horse was done, but not the rider; for, springing to the ground while at full speed, sword in hand, he forsook his tired Horse, and, preferring his own legs, he ran like an Antelope, and for the first hundred yards I thought he would really pass us and win the honour of first blow. It was of no use; the pace was too severe, and, although running wonderfully, he was obliged to give way to the Horses. Only three now followed the Rhinoceroses. Taher Sheriff, his brother Rodur, and myself. I had been obliged to give the second place to Rodur, as he was a mere Monkey in weight; but I was a close third. The excitement was intense; we neared the jungle, and the Rhinoceroses began to show signs of flagging, as the dust puffed up before their nostrils, and, with noses close to the ground, they snorted as they still galloped on. 'Oh for a fresh Horse!' We were within two hundred yards of the jungle; but the Horses were all done. Tétel reeled as I urged him forward; Rodur pushed ahead; we were close to the dense thorns, and the Rhinoceroses broke into a trot; they were done! Away went Taher; he was close to the very heels of the beasts, but his Horse could do no more than his present pace; still he gained upon the nearest; he leaned forward, with his sword raised for the blow—another moment and the jungle would be reached! One effort more, and the sword flashed in the sunshine, as the rearmost Rhinoceros disappeared in the thick screen of thorns, with a gash about a foot long upon his hind-quarters. Taher Sheriff shook his bloody sword in triumph above his head; but the Rhinoceros was gone—we were fairly beaten, regularly outpaced. Taher Sheriff explained that at all times the Rhinoceros was the most difficult animal to sabre, on account of his extraordinary swiftness, and, although he had killed many with the sword, it was always after a long and fatiguing hunt, at the close of which the animal, becoming tired, generally turned to bay, in which case one hunter occupied his attention, while another galloped up behind and severed the hamstring. The Rhinoceros, unlike the Elephant, can go very well upon three legs, which enhances the danger, as one cut will not utterly disable him."

Not unfrequently, however, it is the hunter who has to fly away before the Rhinoceros, as Sir S. Baker found out to his cost in the Upper Nile.

Gordon Cumming, in his "Hunter's Life in South Africa," gives the following details of the Rhinoceros:—"Of the Rhinoceros there are four varieties in South Africa, distinguished by the Bechuanas by the names of the Borèlé, or Black Rhinoceros; the Keitloa, or Two-horned Black Rhinoceros; the Muchocho, or common White Rhinoceros; and the Robaoba, or Long-horned White Rhinoceros. Both varieties of the Black Rhinoceros are extremely fierce and dangerous, and rush headlong and unprovoked at any object which attracts their attention. They never attain much fat, and their flesh is tough, and not much esteemed by the Bechuanas. Their food consists almost entirely of the thorny branches of the waitabit thorns. Their horns are much shorter than those of the other varieties, seldom exceeding eighteen inches in length. They are finely polished with constant rubbing against the trees. The skull is remarkably formed, its most striking feature being the tremendously thick ossification in which it ends above the nostrils. It is on this mass that the horn is supported. The horns are not connected with the skull, being attached merely by the skin, and they may thus be separated from the head by means of a sharp knife. They are hard and solid throughout, and are a fine material for various articles, such as drinking-cups, mallets for rifles, handles for turners' tools, &c., &c. The horn is capable of taking a very high polish. The eyes of the Rhinoceros are small and sparkling, and do not readily observe the hunter, provided he keep to leeward of them. The skin is extremely thick, and only to be penetrated by bullets hardened with solder. During the day the Rhinoceros will be found lying asleep, or standing indolently in some retired part of the forest, or under the base of the mountains, sheltered from the power of the sun by some friendly grove of umbrella-topped mimosas. In the evening they commence their nightly rambles, and wander over a great extent of country. They usually visit the fountains between the hours of nine and twelve o'clock at night, and it is on these occasions that they may be most successfully hunted and with the least danger. The Black Rhinoceros is subject to paroxysms of unprovoked fury, often ploughing up the ground for several yards with its horn, and assaulting large bushes in the most violent manner. On these bushes they work for hours with their horns, at the same time snorting and blowing loudly, nor do they leave them in general until they have broken them in pieces. All the four varieties delight to roll and wallow in the mud, with which their rugged hides are generally encrusted. Both varieties of the Black Rhinoceros are much smaller and more active than the white, and are so swift that a Horse with a rider on his back can rarely overtake them. The two varieties of the White Rhinoceros are so similar in habits that the description of one will serve for both; the principal difference consisting in the length and set of the anterior horn: that of the Muchocho averaging from two to three feet in length, and pointing backwards; while the horn of the Robaoba often exceeds four feet in length, and inclines forward from the nose at an angle of 45°. The posterior horn of either species seldom exceeds six or seven inches in length. The Robaoba is the rarer of the two, and it is found very far in the interior, chiefly to the eastward of the Limpopo. Its horns are very valuable for loading-rods, supplying a substance at once suitable for a sporting implement and excellent for the purpose. Both these varieties of Rhinoceros attain an enormous size. They feed solely on grass, carry much fat, and their flesh is excellent, being preferable to beef. They are of a much milder and more inoffensive disposition than the Black Rhinoceros, rarely charging their pursuer. Their speed is very inferior to that of the other varieties, and a person well mounted can overtake and shoot them. The head of these is a foot longer than that of the Borèlé. They generally carry their heads low; whereas the Borèlé, when disturbed, carries his very high. Unlike the Elephants, they never associate in herds, but are met with singly or in pairs. In districts where they are abundant from three to six may be found in company; and I once saw upwards of a dozen congregated together on some young grass; but such an occurrence is rare."

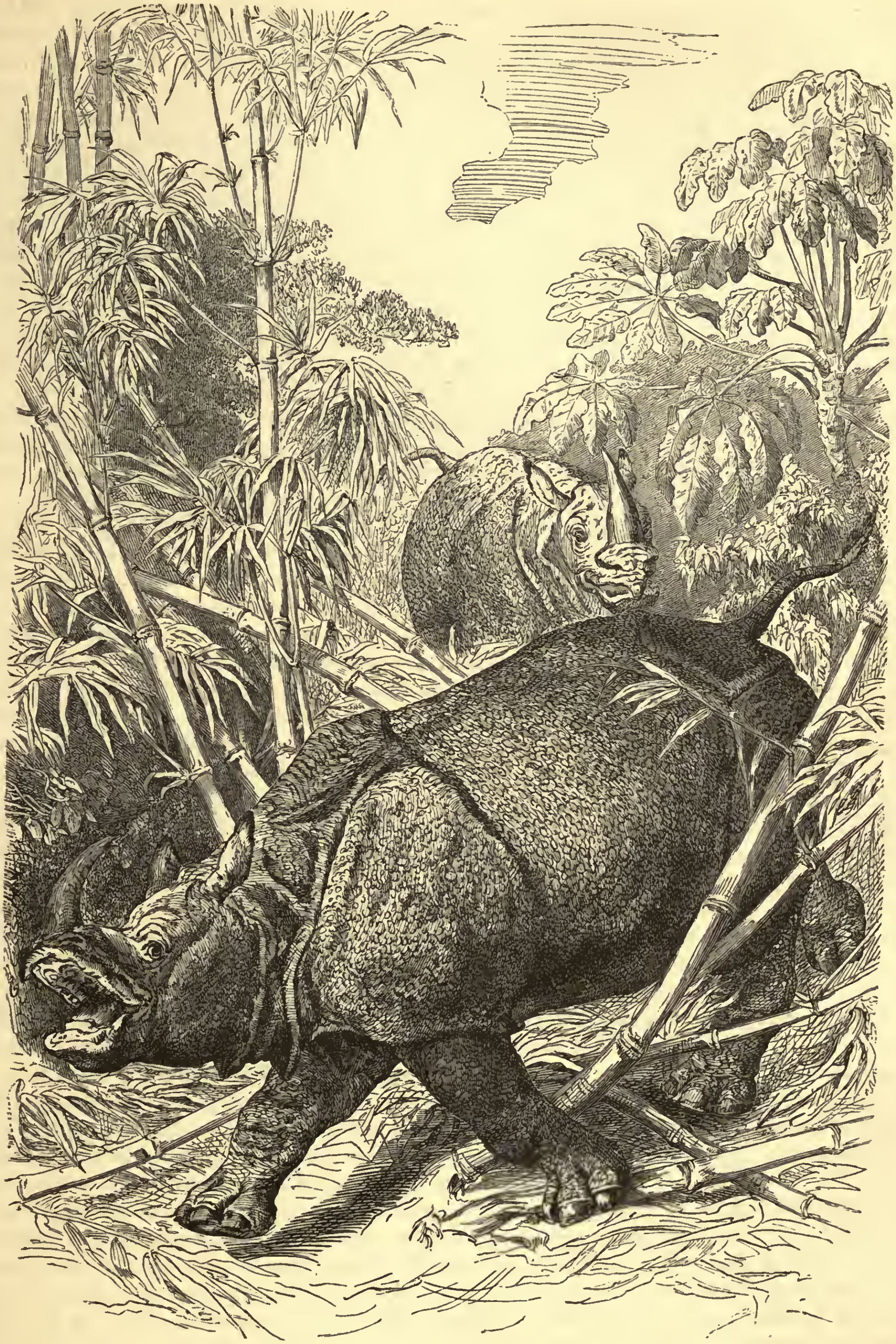
Gordon Cumming relates that the Rhinoceros and Hippopotamus are usually attended by little birds known as Rhinoceros Birds, "their object being to feed upon the ticks and other parasites that swarm upon these animals. They are of a greyish colour, and are nearly as large as a common Thrush. Their voice is very similar to that of the Mistletoe Thrush. Many a time have these ever-watchful birds disappointed me in my stalk, and tempted me to invoke an anathema upon their devoted heads. They are the best friends the Rhinoceros has, and rarely fail to awaken him even in his soundest nap. 'Chukuroo' perfectly understands their warning, and, springing to his feet, he generally first looks about him in every direction, after which he invariably makes off. I have often hunted a Rhinoceros on horseback which led me a chase of many miles, and required a number of shots before he fell, during which chase several of these birds remained by the Rhinoceros to the last. They reminded me of mariners on the deck of some bark sailing on the ocean, for they perched along his back and sides; and as each of my bullets told on the shoulder of the Rhinoceros, they ascended about six feet into the air, uttering their harsh cry of alarm, and then resumed their position. It sometimes happened that the lower branches of trees, under which the Rhinoceros passed, swept them from their living deck; but they always recovered their former station. They also adhere to the Rhinoceros during the night. I have often shot these animals at midnight when drinking at the fountains, and the birds, imagining they were asleep, remained with them till morning; and on my approaching, before taking flight, they exerted themselves to their utmost to awaken Chukuroo from his deep sleep."

THE ASIATIC RHINOCEROSES.

There are four different Rhinoceroses in Asia, of which two are characterised by the possession of one horn, while the remaining two possess two horns, as in the African species. All the adult Asiatic possess incisors or front teeth, which are conspicuous by their absence from the African species. The normal number of these is four in the upper, and four in the lower jaws, the median pair being the larger in the upper, and the smaller in the lower. The development of these teeth seems to stand in relation to the development of horns, those animals with the smallest horns being provided with the largest incisors. The most familiar is the INDIAN RHINOCEROS (*Rhinoceros unicornis = R. indicus*, Cuvier), with a single horn on the nose, and thick naked skin covered with large boss-like granulations, which lies in massive folds on various parts of the body, and more especially behind and across the shoulders and before and across the thighs. There are a few stiff hairs on the tail and ears. It inhabits the East Indies, principally beyond the Ganges, and is recorded as having been found in Bengal, Siam, and Cochin-China. It is found in shady forests, the neighbourhood of rivers, and marshy places, its food consisting of herbage and branches of trees. The fully-grown animal rarely arrives at a greater height than five, and its average may be taken at four feet.

FRONT AND SIDE VIEWS OF HEAD OF SUMATRAN RHINOCEROS.
(From the *Proceedings of the Zoological Society.*)

Williamson, in his "Oriental Field Sports," speaking of the Indian Rhinoceros, describes it as an inveterate enemy of Elephants, attacking whenever he can find them single, or, at least, not protected by a male of great bulk; ripping without mercy, and confiding in his coat of mail to defend him from the puny attacks of the females, as well



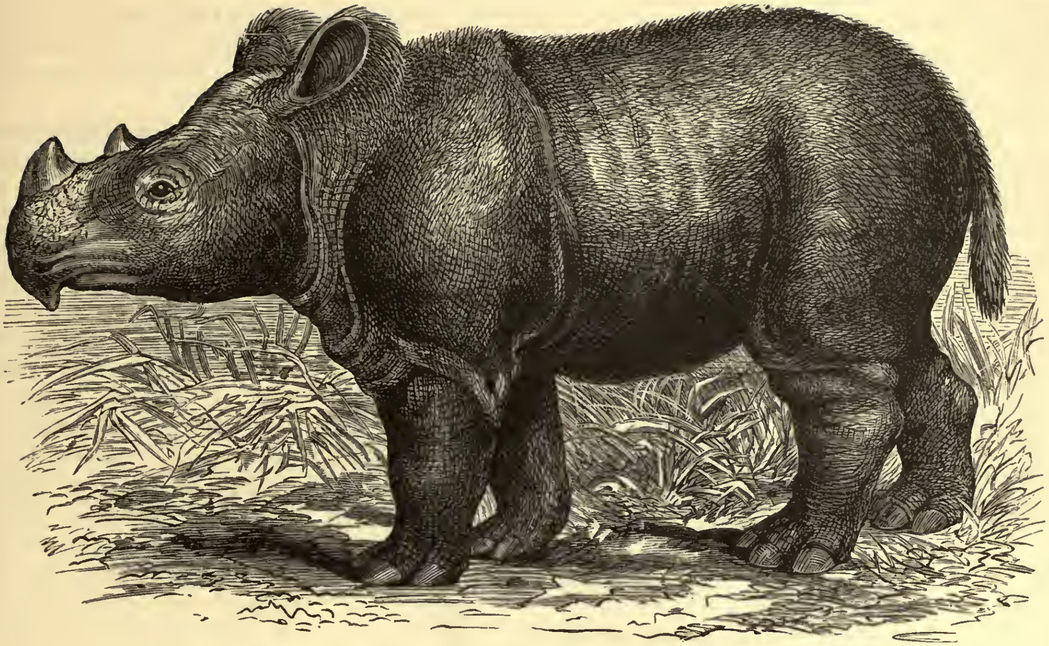
INDIAN RHINOCEROS.

as to resist the tusks of young males. He relates that the apparent bluntness of the horn of the Indian Rhinoceros, which is about as broad at the base as it is high, would make it appear a somewhat insignificant weapon, and inadequate to penetrate any hard or tough substance. This, however, we are informed, is not the case, Elephants often being found dead, obviously, it is stated, from the wounds received from the horn of the Rhinoceros; and in one case, as is related by Williamson, a large male Elephant and Rhinoceros were found both dead together, the Elephant's abdomen having been ripped open, and the Rhinoceros's horn found transfixed beneath the ribs. Williamson also states that Major Lally, an officer of the Indian army, whose veracity is beyond question, while engaged in one of his hunting expeditions, and having arrived at the summit of a low range of hills, was suddenly presented with a distinct view of a most desperate engagement between a Rhinoceros and a large male Elephant, the latter, to all appearance, protecting a small herd which were retiring in a state of alarm. The Elephant was beaten, and decamped, followed by the Rhinoceros, into a heavy jungle, where much roaring was heard, but nothing could be discerned. From this we may conclude that the habit which Pliny describes of the Rhinoceros ripping open the Elephant is confirmed by modern observation.

THE JAVAN RHINOCEROS (*R. sondaicus* = *R. javanus* of Cuvier) is a smaller representative of the Indian Rhinoceros, with the skin not so coarsely granulated, and the folds not so strongly marked. It is covered with a sparse growth of bristles, and its head and limbs are longer and more slender in their proportions than in the latter species. It inhabits Java and the Malay Peninsula, and the Sunderbunds of Bengal, living on herbage and the branches of trees.

THE SUMATRAN RHINOCEROS (*R. sumatrensis* of Cuvier) is the more commonly known of the two two-horned species inhabiting Asia. Its head is armed with two obtusely-pointed horns, its body is covered with bristles, and the folds of the skin are deep, and especially that behind the shoulder. The folds on the neck, however, are not so distinct as in the one-horned species.

THE HAIRY-EARED RHINOCEROS (*R. lasiotis*) has been confounded by naturalists with the Sumatran species, until Dr. Sclater showed from the comparison of these two animals, in the Zoological Gardens, that they were specifically distinct. The former is characterised by the long hairy fringe to the ears, by the covering of long fine reddish hair on the body, the smoother and more finely granulated skin, and the shorter tail. The one in Regent's Park was captured in January, 1868, under very singular circumstances, as described in the following extract from a Calcutta newspaper:—"The quiet station of Chittagong has been lately enlivened by the presence of a Rhinoceros. It appears that about a month ago some natives came into Chittagong and stated that a Rhinoceros had been found by them in a quicksand, and was quite exhausted with the efforts to relieve herself. They had attached two ropes to the animal's neck, and with the assistance of about 200 men dragged her out, and keeping her taut between two ropes they eventually made her fast to a tree. The next morning, however, they found the Rhinoceros so refreshed, and making such efforts to free herself, that they were frightened, and made application to the magistrate of Chittagong for protection. The same evening Captain Hood and Mr. H. W. Wickes started with eight Elephants to secure the prize, and after a march of about sixteen hours to the south of Chittagong they came up with the animal. The Elephants, at the first sight of the Rhinoceros, were very much afraid, and bolted one and all, but after some exertion they were brought back and made to stand by. A rope was now with some trouble attached to the animal's hind leg, and secured to an Elephant. At this juncture the Rhinoceros roared; the Elephants again bolted, and had it not been for the rope slipping from the leg of the Rhinoceros, that limb might have been pulled from the body. The Rhinoceros was, however, eventually secured with ropes between Elephants, and marched into Chittagong in perfect health. Two large rivers had to be crossed—first the Sungoo River, where the animal was towed between Elephants, for she could not swim, and could only just keep her head above water by paddling with the fore-feet like a Pig; and, secondly, the Kurnafoolie River, when the ordinary cattle ferry-boat was used. Thousands of natives thronged the march in, which occupied a few days, the temporary bamboo bridges on the Government road invariably falling in with the numbers collected thereon to watch the Rhinoceros crossing the stream below; and sometimes the procession was at least a mile in length. The 'Begum,' as the Rhinoceros has been named, is now free from all ropes, and kept within a stockade enclosure, having therein a good bath excavated in the ground, and a comfortable covered shed attached. She is already very tame, and will take plantain leaves or chupatties from the hand,



HAIRY-EARED RHINOCEROS. (From the *Proceedings of the Zoological Society.*)

and might almost be led about by a string." Begum was ultimately brought to London, and sold to the Zoological Society for £1,250.

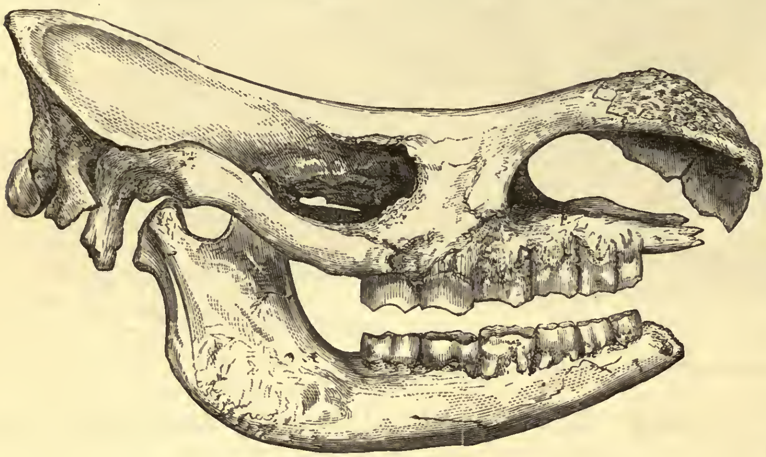
THE FOSSIL RHINOCEROSES.

Although the species of Rhinoceroses living at the present time are but few, the researches of palæontologists show us that in past time the number of species was considerable, and that they were not, as now, confined to the warmer parts of the Old World, but were distributed over a large portion of Northern Asia and Europe.

The first representative of the Rhinoceros family is the *Orthocynodon*, an animal with large upright canines, discovered in the Upper Eocene strata of the United States. The fossil Rhinoceroses properly so called are first found in the Miocene, and are divided into four groups. The first group is characterised by the nostrils being separated by a bony partition, and in the adult animal the incisor teeth are lost: the second is distinguished by the absence of a bony partition between the nostrils, and the incisor teeth are of a medium size: in the third there is no partition, but the incisors are large; and in the fourth it is imperfectly developed.

An example of the first group, and probably the best known form of all the extinct Rhinoceroses, is *Rhinoceros tichorhinus*, or the Woolly Rhinoceros. Like that of the Mammoth, with which animal it was evidently associated, its entire body was covered with hair and wool, the skin had no folds, and its nose carried two horns, the anterior of which was of remarkable size, and characteristic of the group to which it belongs; the nostrils were separated by a complete bony partition. The Woolly Rhinoceros has been discovered under similar circumstances to that of the Mammoth, having been found embedded in ice in the northern latitudes of Asia, in the years 1771 or 1772, being some twenty years previous to that of the discovery of the first Mammoth by a fisherman named Schumachoff. According to Pallas, the discovery was made by some Yakuts, who were on a hunting expedition, and took its dimensions on the spot; it was about eleven and a half feet in length. Its body was still clothed with skin, but altogether the animal was so far decomposed that not more than the head and feet could be brought away. On the skin many short hairs still remained. The range of the Woolly Rhinoceros was undoubtedly the same as that of the Mammoth, except that it did not cross Behring Strait, and, consequently, its remains are not found in America. The remains of the Woolly Rhinoceros are found in numerous caves in association with the remains of Hyænas, having undoubtedly been a staple article of food for these animals. In England remains have been found in the caves at Creswell, Nottinghamshire; in the Brixham Cave; in Kent's Hole, near Torquay, Devonshire; and in Wookey Hole, near Wells, Somerset, as well as in the caves of Wales and Derbyshire.

As an example of the second group, we have *Rhinoceros megarhinus* of the Pliocene and Pleistocene strata. This animal possessed two horns. Its remains are found in France and Italy, and in the pre-glacial forest bed of Cromer, and in the lower brick earths of the Thames valley. *Rhinoceros incisivus* represents the third group in Miocene times. It had no bony septum between the nostrils, the incisors are large, and there are four toes on the fore-foot. Of the fourth group the best examples are *R. etruscus* and *R. leptorhinus.* The former of these possessed two horns, and the nostrils were separated by an imperfect bony septum. Its remains are found in various Pliocene and Pleistocene deposits. The latter also possessed two horns, and its nostrils were divided by a thin and delicate bony partition, which can only be termed imperfect in comparison with the massive partition in the Woolly Rhinoceros. It is devoid of incisors. This species is found in Pleistocene deposits in Britain, France, and Italy, in caverns, and in river-beds, the most perfect remains being met with in the valley of the Thames near Ilford. These were collected by Sir Antonio Brady, and are now to be seen in the British Museum. In the figure the fragile nose septum is represented as broken.



SKULL OF FOSSIL RHINOCEROS [R. LEPTORHINUS].

The genus *Aceratherium*, of Kaup, is a hornless Rhinoceros, found in the same Miocene strata as the *R. incisivus.* Like the latter, it possesses incisors, and, not improperly, may be considered as a female of the latter species, if the horn be viewed as a sexual characteristic: first of all in the possession of the male, and afterwards transferred by descent, in the case of all the Post-Miocene Rhinoceroses, to the female.

THE EXTINCT FAMILY PALÆOTHERIDÆ.

The Palæotheridæ, or fourth family to be considered under the head of the Perissodactyla, is that which is found only in the fossil state in the Eocene strata of Europe and North America. They are allied, on the one hand, to the Horses, and on the other to the Tapirs. The type of the family, the Palæotherium, was originally discovered by Cuvier in the quarries of Montmartre, near Paris. The grinding teeth closely resemble, in the pattern of their grinding surfaces, those of the Rhinoceros. The full complement, however, of incisors and canines, as well as of grinders, is present in each jaw, namely—Incisors, 3; canines, 1; premolars, 4; molars, 3. These animals varied in size from that of a Roedeer to that of a Tapir, and were possessed of three well-developed hoof-bearing toes.

The genus Macrauchenia is also an extinct form, constituting a separate family, Macraucheniadæ, peculiar to the later Tertiaries of South America. Its skull is, on the whole, like that of the Horse, but the nasal bones are short and like those of the Tapir. It possessed a long neck, like the Llamas, and a full complement of teeth, partly equine, partly resembling those of Rhinoceros. Both fore and hind feet were furnished with three toes.

W. Boyd Dawkins.
H. W. Oakley.

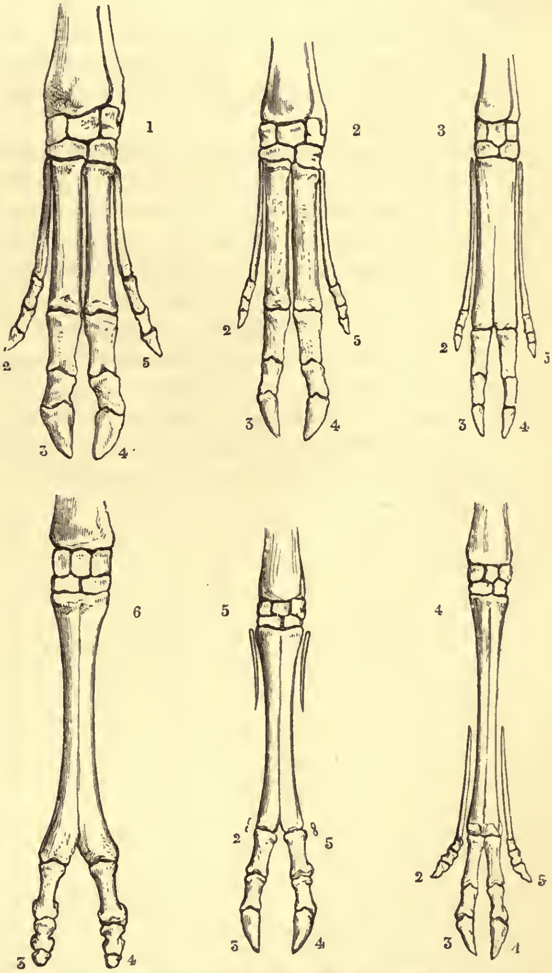
CHAPTER III.

ARTIODACTYLA—THE PIG OR HOG FAMILY.

Introductory Remarks on the Artiodactyla—Character of their Feet—The Wanting Digit—Comparison of the Bones of the Fore Feet of Representative Animals—Other Characters in the Artiodactyla—Classification—SUIDÆ, OR HOG FAMILY—Groups of the Family—Snout—Sense of Smell—Libels—Mention in the Bible—Among the Jews—Range—Teeth—The Wild Boar—General Features—Habits—Historical Mention—The Indian Hog—Habits—A Wild Boar Hunt—A Noble Foe—The Domestic Hog—The "Irish Greyhound Pig"—Effects of Domestication—The Solid-hoofed Breed of Pigs—Description of the Bones of Foot—Masked Pig—Bush Hog—Babirusa—The Wart Hogs—Ælian's Wart Hog—The Ethiopian Wart Hog—Peccaries—Habits—Dentition—Feet—Species—The Fossil Hogs.

SUB-ORDER ARTIODACTYLA.

Besides the Perissodactyla there is another large group of animals in which the extremities of the fore and hind toes are entirely surrounded by horny tissue in the shape of hoofs. These are the Artiodactyla, or cloven-hoofed animals, which differ from the Perissodactyla in the manner in which the weight of the body is carried upon the feet. In the Artiodactyla the toes are even in number, being four in all the feet, except in the Camel tribe, the Giraffe, and a very few Antelopes, in which only two are present. It is the digit which corresponds to the human thumb in the fore foot, and to the great toe in the hind, which is always deficient, the inner and the outer digits (the second and the fifth) being frequently reduced to but minute rudiments, as in the Sheep and Ox. Some may ask how we know that it is the thumb and the great toe which are missing, and not the little finger or toe, for instance. A glance at the human hand and foot will explain the point. Counting the bones in the thumb or great toe, it will be found that there are but two bones beyond the limit of the "ball of the thumb," or the free part of the great toe, whilst in all the other fingers and toes three bones can be counted. A reference to Fig. 3 makes it evident that in the Artiodactyla there figured, as in all others, each toe has three bones in it; and as all mammalian animals which have five toes agree with man in possessing one less bone in the inner toe than in any of the others, it is but logical to conclude that when four toes only are present, all possessing an equal number of bones, the one absent is that corresponding to the thumb and great toe. Each foot is always symmetrical in itself, at the same time that its imaginary axis, which is the line drawn down the middle of it, runs between the two medial toes, they corresponding with the third and fourth of the human limb. The accompanying drawings of the bones of the fore-foot of the Pig, the Water Chevrotain (or Deerlet), the Javan



BONES OF THE LEFT FORE LIMB OF (1) COMMON PIG, (2) AFRICAN DEERLET, (3) JAVAN DEERLET, (4) ROEBUCK, (5) COMMON SHEEP, (6) CAMEL.*

(From Specimens in the Museum of the Royal College of Surgeons.)

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* The numbers in each figure refer to the digits, the thumb being always absent. The seven square-shaped bones above the digits in each figure constitute the wrist or carpus. Above these are the large radius, and the small ulna in some.

Chevrotain, the Roebuck, the Sheep, and the Camel, illustrate, better than can be done by words, the difference in the degree of development of the outer toes found in the group. In the Pig all the four toes are well developed, and there is no consolidation of their constituent elements. In the Water Deerlet of West Africa the external toes are smaller, whilst, as in the Pig, each metacarpal—which is in the human hand the part of each finger included within the palm—is independent of its neighbour, the Javan Deerlet differing in having the third and fourth fused into a "cannon" bone. But in the Red Deer the reduction of the second and fifth digits is so great that their metacarpals are not perfect, being only present in their upper parts; whilst the phalanges, or lower bones, are very small, being reduced in the Sheep to mere bony spots with minute hoofs, which latter are quite absent in the Camel, Llama, Giraffe, and Pronghorn Antelope.

There are numerous other characters which associate these animals, and prove the natural affinities of the different species, at the same time that in geologic times there existed other creatures which fill up the intervals between existing forms, and conclusively demonstrate the manner in which the order has been evolved from a common type in times long past.

All the Artiodactyla are strictly terrestrial, none being arboreal in their habits. The Hippopotamus is the only member of the group which is aquatic, spending much of its life in the water, without, however, any special modification of its limbs or tail like that found in the more truly aquatic Seals, Sirenia, or Whales.

There is a great uniformity throughout the order in the general plan upon which the limbs are constructed. In all the species the wrist in the fore limb—commonly called the knee—and the heel in the hind limb—the hock—is raised a considerable distance above the ground, at the same time that the whole weight of the body is carried upon the extreme tips of the toes, the terminal bones of which are expanded within the hoof to increase the basis of support. The collar-bone is absent in all, as it is in nearly every animal that does not use its fore limbs for any other purpose than that of carrying the weight of the front parts of its body.

In the Perissodactylate Rhinoceros the horn or horns is or are situated in the middle line of the face above the nose, and are not supported upon any bony horn core. In all those Artiodactyla which carry horns or antlers, there are appendages paired and lateral in position, at the same time that they are either supported upon bony cores, or are formed of bone itself, and are situated upon the forehead.

The following table best represents our present knowledge as to the classification of the Artiodactyla:—

ORDER UNGULATA .	SUB-ORDER ARTIODACTYLA .	Non-ruminants .	Pigs of the Old World. Peccaries of the New World. Hippopotami.
		Ruminants .	Camels. Llamas. Chevrotains or Deerlets. Bovidæ (Oxen). Cervidæ (Deer).

A. H. GARROD.

I.—SUIDÆ, OR HOG FAMILY.

THE Non-Ruminantia, or Artiodactyls which do not chew the cud, possess the following characters: they usually have more than one pair of incisors in the upper jaw, they are devoid of horns, and the stomach has rarely more than two divisions. In only one genus, that of the Peccary, are the metatarsal and metacarpal bones united into one compact bony mass. They are divisible—as the above table indicates—into three families: the Suidæ, or Hogs, the Hippopotamidæ, or Hippopotamuses, and the Anoplotheridæ,* or Anoplotheres, an extinct family, met with only in the Eocene strata of the Old and New Worlds.

* ἀ, without; ὁπλή, a hoof; θηρίον, wild beast; wild beast without hoof.

The Hog family may be divided into three well-marked groups:—1, the True Swine, consisting of three genera, Sus, Potamochœrus, and Babirusa; 2, the Wart Hogs, represented by one genus, Phacochœrus; and 3, the Peccaries, represented also by one genus, Dicotyles. They have three kinds of teeth—incisors, canines, and boss-covered or transversely ridged grinders—slender limbs, and the third and fourth toes are considerably larger than the second and fifth.

In order to enable the Hog family to "root" or turn up the ground, they are provided with a truncated and cylindrical proboscis, or snout, which is capable of considerable movement. The skin is more or less supplied abundantly with hair, and the tail is short, and in some cases merely represented by a tubercle.

The sense of smell in the Hog is very acute, and when its broad snout ploughs up the herbage, not a root, an insect, or a worm, escapes the olfactory sense. Although credited with stupidity, the Hog in its native state is to be styled anything but a dull and lethargic animal, neither is it the filthy animal that domestication has reduced it to. Properly cared for, the Pig is as cleanly in its habits, and as capable of strong attachment, as any other creature.

No animal that is mentioned in the Bible—not even the Dog—is spoken of with more abhorrence than the Pig; and even at the present day a Jew or Mohammedan looks upon this creature with anything but a generous feeling, treating it as something utterly detestable. So great was the horror with which the older Jews regarded the Hog, that they would not even mention it by name, but called it "the abomination." The origin of the great antipathy which the Jews have always experienced for the Pig appears to be lost in antiquity. In Lev. xi. 7, the Hog is spoken of with other animals as being unclean and unfitted for food, simply because it did not chew the cud, although the hoof was divided. It has, however, been suggested that the Pig was so strictly prohibited by Moses from being eaten, on account of its flesh being supposed in a hot country to cause skin-diseases, and especially the dreaded leprosy; but it is to be doubted whether Moses is to be considered as the originator of the horror with which the Hog has been and still is regarded. It seems probable that this disgust dates from a period of far greater antiquity than that of Moses; and it is certain that the flesh of Swine can be eaten in hot countries without producing any bad effects. It is a matter of considerable wonder, that while Swine are held in such abhorrence, we read of herds being so often kept in Palestine. In the Gospel of St. Matthew (viii. 28–34), we read of a herd of Swine being entered by devils, and which, so possessed, rushed down a hill and were drowned in the sea. Again, in the parable of the Prodigal Son, we are told of his becoming a swineherd. Although Pigs were so much disliked, the Jews were evidently well acquainted with their habits, as we read in the Second Epistle of St. Peter (ii. 22), where the apostle refers to the fact of Pigs wallowing in the mire. It is also remarkable that with the exception of one passage in the Bible, the mention of the Hog is confined to those in a domesticated state, this exception being found in Psalm lxxx. 13: "The boar out of the wood doth waste it, and the wild beast of the field doth devour it."

The genus Sus, or Hog proper, ranges, in the wild state, over the greater portion of the Old World, through Central and Southern Europe into Central and Southern Asia, and as far to the east and south as New Guinea. It is also met with in the North African forests, in the region north of the Sahara desert. It is conspicuous by its absence from North and South America, Australia, and the cold northern regions of Europe and Asia.

The adult teeth in the True Hogs (genus *Sus*) are forty-four, of which there are in each jaw three incisors, one canine, four premolars, and three true molars. The canines are very variable in size, being reduced to a minimum under domestication, and arriving at a maximum in the wild males.

THE WILD BOAR* inhabits Europe, North Africa, and Hindostan, each country having its own peculiar type or race, which sometimes is so marked as to constitute separate species in the opinion of first-rate naturalists.

The Wild Boar is distinguished by a body generally of a dusky-brown or greyish colour, having a tendency to black, and being diversified with black spots. The canines or tusks in the male are long and powerful, and project beyond the upper lip, the mouth is large, and the elongated head is set on a short neck rising out of a thick and muscular body. The size is variable, an old Wild Boar recorded by Desmarest being five feet nine inches long, while a four-year-old of the more ordinary size measured three feet without the tail. The female is smaller than the male, and with smaller tusks. The hairs of the body are coarse, intermixed with a downy wool. On the neck and shoulders the hairs take the form of bristles, being long enough to assume a kind of mane which the animal is enabled to erect if irritated. The young has the body marked with longitudinal stripes of a reddish colour.

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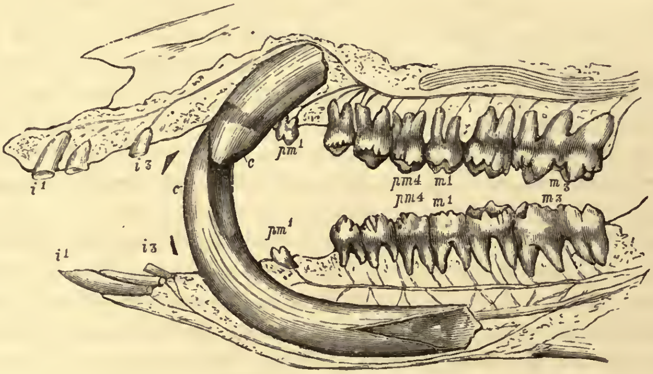
* *Sus scrofa.*

In its habits the Wild Boar is by choice herbivorous, feeding on plants, fruits, and roots; but it will also eat Snakes, Lizards, and various insects, and when pressed by hunger nothing appears to come amiss to its voracious appetite; it is stated that even dead Horses are sometimes called into requisition. The Boar is nocturnal in its habits, rarely leaving the shadow of the woods in the day-time, and coming forth as twilight approaches in search of food, delighting in roots often deeply embedded in the soil, and which its keen sense of smell enables it easily to detect. Much mischief is often done by this animal, which ploughs up the ground in continuous furrows for long distances, and is not content, like the domesticated variety, with ploughing up a spot here and there.

The Wild Boar was formerly an inhabitant of Great Britain. According to Bell, "About the year 940, the laws of Hoel Dha direct that it shall be lawful for the chief of his huntsmen to chase the Boar of the woods from the fifth of the ides of November (9th), until the calends of December (1st), Cap. xxi. sect. 14." In the next century Bell states that "the numbers had perhaps begun to diminish, since a forest law of William I., established in A.D. 1087, ordained that any who were found guilty of killing the Stag, the Roebuck, or the *Wild Boar*, should have their eyes put out; and sometimes the penalty appears to have been a painful death. It appears," continues Bell, "that Charles I. turned out some Wild Swine in the New Forest, for the purpose of restoring the breed to that royal hunting-ground; but they were all of them destroyed during the civil war. A similar attempt was made in Bere Wood, in Dorsetshire; but one of the Boars having injured a valuable Horse belonging to the worthy Nimrod who exhibited this specimen of sporting epicurism, he caused them to be destroyed."



DENTITION OF WILD BOAR.

The Wild Boar probably became extinct in Britain before the reign of Charles I.; while in Ireland it was abundant as late as the seventeenth century.

The Indian Hog* differs but little in general appearance from the European Wild Boar, and is looked upon in the East as a most exciting object of the chase, its speed, endurance, and courage making it one of the most formidable and dangerous animals that can possibly be encountered.

The habits of this animal are admirably portrayed by Williamson, in his "Oriental Field Sports." After describing the extraordinary speed this creature is possessed of, equalling that of a good Horse, and asserting that a moderate-sized Hog can, and often does, overthrow Horses and their riders, he states that "The Wild Hog delights in cultivated situations; but he will not remain where water is not at hand, in which he may, unobserved, quench his thirst and wallow at his ease. Nor will he resort for a second season to a spot which does not afford ample cover, whether of heavy grass or of underwood jungle, within a certain distance, for him to fly to in case of molestation, and especially to serve as a retreat during the hot season, as otherwise he would find no shelter. The sugar-cane is his great delight, both as being his favourite food, and as affording a high, impervious, and unfrequented situation. In these, Hogs commit great devastation, especially the breeding Sows, which not only devour, but cut the canes for litter, and throw them up into little huts, which they do with much art, leaving a small entrance which they stop up at pleasure. Sows never quit their young Pigs without completely shutting them up. This, indeed, is requisite only for a few days, as the young brood may be seen following the mother, at a round pace, when not more than a week or ten days old. The canes are generally planted about the end of May or beginning of June, in ground rendered extremely fine by digging. For this purpose cuttings of canes are buried horizontally, and with the first showers of the rainy season, which usually commences in the middle of June, the several joints throw out shoots that grow so rapidly, as often to be two or three feet high by the beginning of September. The red cane, called the *bun-ook*, which is not so valuable as the smaller or yellower sort, begins to ripen in September; by the end of which month it will have attained the height of seven or eight feet. These serve as the first receptacles for the Wild Hogs, which having suffered, since the harvest in March, all the inconveniences of bad diet, long nightly excursions, scarcity of water, great diurnal heat, and frequent disturbance, arrive among them in excellent running order. It should be observed that throughout India a custom prevails of setting fire to the grass jungles in the month of May, when they are completely dry, for the purpose of increasing the growth of the new grass, by the stimulus of the ashes which are washed in with the first showers in June." Williamson goes on to say that "the *bun-ook* is commonly cut in November, and the Hogs then shift to the yellow canes, which are by that time forward enough to serve as sufficient cover. Canes require much manure and excellent tillage;

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* *Sus scrofa* (Indian variety).

WILD BOAR.

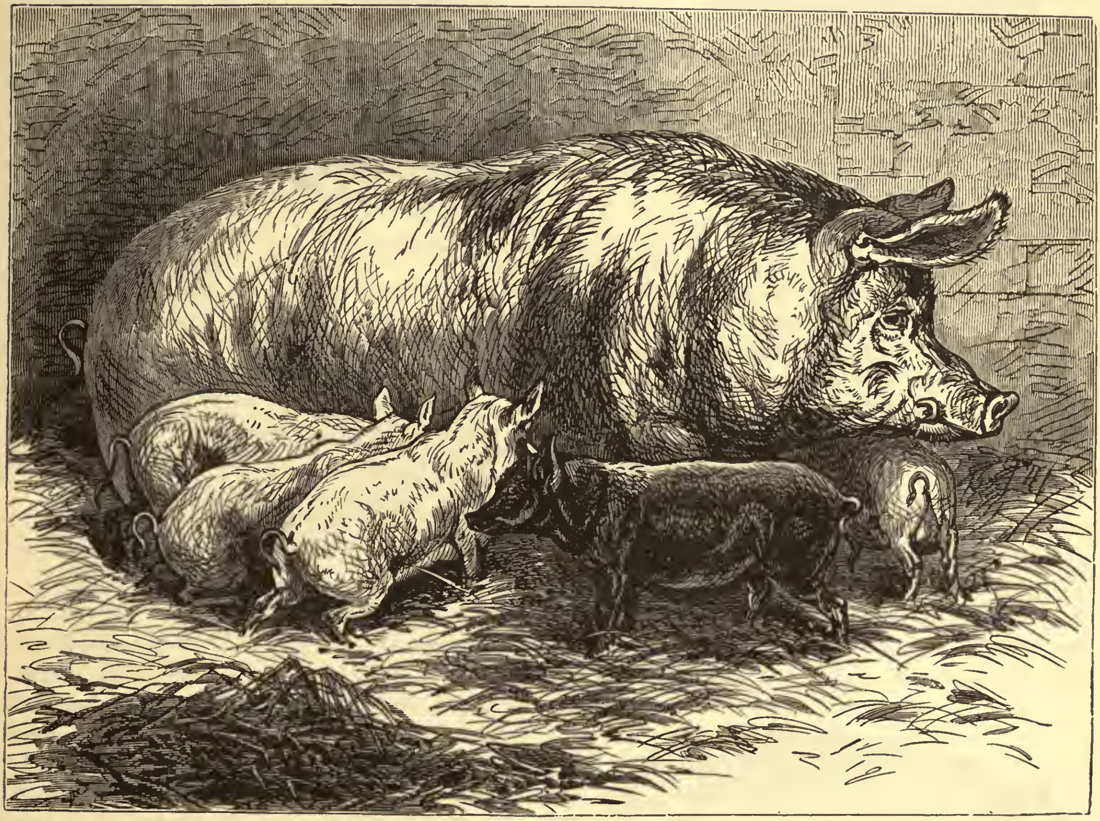
consequently they are usually planted near to villages, and surrounded by fields of wheat, barley, and other grain. A species of lupin called *rhur* is cultivated in large quantities. It grows luxuriantly, generally to the height of eight or nine feet, forming quite a wilderness. . . . In these *rhur* fields Hogs delight, as they are completely umbrageous, but being open below, admit the air freely. Besides, this wild rice growing very thick among the *rhur*, and a kind of soft downy grass about a foot in height, they find themselves very comfortably situated. About the middle of March, or, at the latest, by the beginning of April, the Hogs must shift their quarters, the canes and grain being by this time generally cut. However, they often retain possession to the last moment, frequently disputing every inch with the reapers, and not rarely causing them to leave parts uncut, in the hope that the Hogs will evacuate them; which, if the jungle whither they must betake themselves happen to be remote, they feel no great disposition to do. For at this season the Hog is extremely heavy and indolent, in consequence of the abundance of the excellent food to which he has, for five or six months, been habituated. Hogs are often killed in March with three and four inches of fat on their chines and shoulders. Exclusive of the habits of ease in which he has so long indulged, it is probable the Hog feels diffident as to his want of exercise, and ability to travel under such a mass of flesh. Besides, he is extremely tenacious of the spot which has so long pampered him; and, although unable to proceed any distance without being blown, yet the short sallies he makes to attack such as venture near his haunt are marked with vigour and resolution. Sometimes he will do considerable mischief with his tusks. . . . Great numbers are at this season either caught in nets made for the purpose, or they are shot by the *shekarries*, or native sportsmen, a circumstance that never fails to afford a happy triumph to the affrighted villagers."

The Wild Boar of India is hunted usually by men on horseback, armed with spears of a more or less variable length, averaging from about six feet and a half to eight and sometimes ten feet. The shaft of a spear consists of bamboo properly weighted with lead; the spear itself is a broad and stout blade. It is held by a man on horseback in such a manner that about a foot and a half projects in front of the stirrup-iron, and the Horse is ridden in such a way that when the Boar charges it is transfixed by the spear.

An account of a Wild Boar hunt of an exceptionally interesting and exciting nature is related by Captain Shakespeare:—"While beating the sugar canes for Wild Hogs, a few miles from Hingolu, a villager came and said, 'If you want to see a Hog come with me;' and leading the way over the brow of a hill, pointed out an object in a field below, that in the mist of the morning appeared like a large blue rock, much too large for a Hog. However, the object presently got on its legs, and dissipated every doubt existing as to its character. About a hundred yards distant from the animal was a fissure in the hills, thickly wooded, and here, no doubt, was the Boar's lair; and if he took alarm and rushed thither, it would be next to impossible to dislodge him. A savage Boar in his stronghold is as difficult to oust as the Grizzly Bear from his winter cave in the Rocky Mountains. He constantly rushes out, knocks over and gores the beaters nearest the mouth of his retreat, and then skips back again before there is the shadow of a chance of spearing him."

After describing the way in which he managed to place himself between the Boar and his retreat, Captain Shakespeare continues:—

"Standing as I was, behind a hedge considerably higher than my mare's head, I did not see the Boar. The duffadar (native officer) was some thirty yards to my left, and looking over a lower part of the hedge, shouted out, 'Look out! here he comes!' The mare was standing still, and I had but just time to drop my spear point, which caught the Boar in the rise, and the blade was buried in his withers. My mare, from her standing position, cleared with one bound the Boar, spear and all, as this was carried out of my hand; then suddenly turning, was in her stride after the Hog. The Hog had but seventy yards to reach the jungle, and just as he struck the first branch of the jungle with his back, breaking in two the shaft of my spear (which was still fast in his body), the duffadar closed with him. The Boar, having been missed by the spear, ran under the duffadar's Horse, and for thirty yards lifted him off his legs, plunging and kicking till the rider came to the ground. Fortunately we had three Dogs with us; and having shouted to the people to let them go, they came up and took the attention of the Boar at the moment he was on the duffadar, who had fallen on his sword and broken it, and was utterly helpless. The next moment the Boar made full tilt for his stronghold, the Dogs following close at his heels. Armed with a fresh spear, I rode up the face of the hill, and from thence looking down saw the Boar at bay and surrounded by the Hounds, but in such a situation that it was impossible on horseback to go to the assistance of the Dogs. At this moment one of the beaters came running up with a heavy double-barrelled rifle, and being apprehensive that the Hounds would be speedily slaughtered if not relieved, I took the gun, and dismounting, resolved to attack the Boar on foot. Just as I got to the bottom, I saw the monster Boar with his back to a tree, and the three Dogs looking very cautiously at him. He was about forty yards from me. Directly he saw me, putting his head a little down to take aim, he came straight at me, increasing his pace from the trot to the charge. When about fifteen yards off, he received the first bullet of my rifle in his neck, Taking not the least notice of it, he came on, and the second barrel fired at him, at about five yards, broke his left under jaw-bone at the tusk. Fortunately I brought my rifle down to the charge, and striking it with his head, the Boar sent me over on my back. While running over me he made a glance, and wounded me in the left arm. Had I not put down my rifle-barrel at the moment, most probably his tusks would have been buried in my body. As it was I had two shooting jackets on, it being a very cold morning, and I suffered more from the jar than the wound. As I lay, I seized the end of my rifle-barrel, determined to sell my life as dearly as possible. To my delight, I must say, I saw the Boar knock over the man who was running down with my big spear. He did not turn on either of us; for the Boar is a noble foe, rarely turning, unless desperately wounded and unable to go on, to mutilate a fallen enemy. The Dogs immediately tackled him, and permitted me, though almost breathless, to get up. The rifle-stock was cracked, and the pin that fastens the barrel into the stock much bent. Having put this to rights, I loaded, and, proceeding in the direction the Boar had gone,



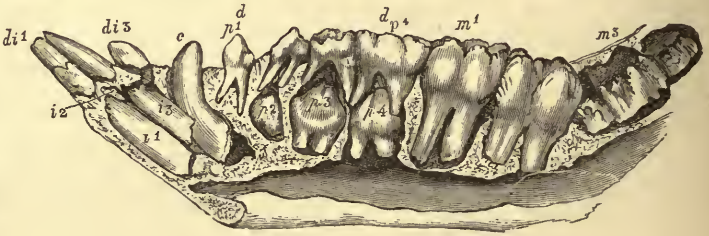
DOMESTIC SOW AND YOUNG.

came up to within fifteen yards of where he had halted and stood regarding me vengefully. Taking aim I sent a bullet through his eye into his brain, and rolled him over dead. I have stated that the Boar is the most courageous animal in the jungle. There he was; with a broken spear in his withers, the shaft sticking up a foot and a half from the blade, knocking over a horseman and wounding his Horse; receiving two bullets —ten to the pound— the first in his neck and throat, the second breaking his jaw, and fired within a few feet of his muzzle; making good his charge, cutting down his enemy like grass, wounding him; knocking over a second man armed with a spear; defying the Dogs; and then, in the act of charging again, shot in the brain, and dying without a groan."

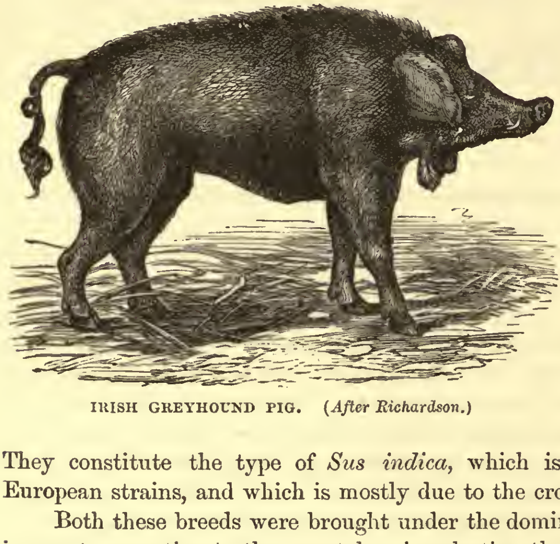
HEAD OF DOMESTIC PIG.

HEAD OF WILD BOAR.

The Domestic Hog is proved by the researches of Nathusius and Rütimeyer to be descended from two distinct wild stocks—the Wild Boar, and an Eastern type known now only in the domesticated condition, and named *Sus indica* by Pallas. The breeds of Hogs descended from the Wild Boar are to be found in various parts of Northern and Central Europe, and resemble their progenitors in the length of their legs, and the development of their tusk. The skull, however, has become higher and broader, and their tusks are not so large, and the body is not covered with such a dense coating of hair.



MILK DENTITION OF PIG.
d, deciduous or falling-out [milk] teeth.

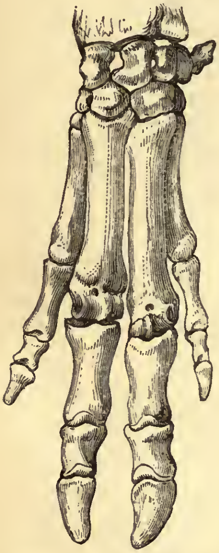

IRISH GREYHOUND PIG. (*After Richardson.*)

The old "Irish Greyhound Pig," of Richardson, may be taken as an example of one of the domestic races descended from the Wild Boar. Sometimes in this breed, as in the Normandy Pigs, a peculiar pendant, about three inches long and covered with bristles, is to be seen attached to the corner of the jaw, as in the accompanying figure.

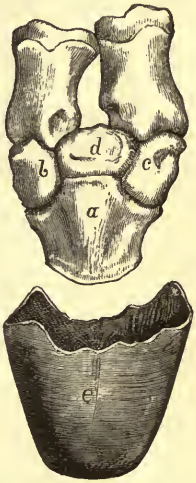
The domesticated breeds of China and Siam have, among other characters, broader and stouter heads than those which are descended from the Wild Boar, and are best known to Englishmen under the form of the Chinese breed. They constitute the type of *Sus indica*, which is now so largely represented among the various European strains, and which is mostly due to the crossing of the two original stocks.

Both these breeds were brought under the dominion of man in a very remote age, and have varied in exact proportion to the care taken in selecting the various characters. Both are found in the pile-dwellings in the Swiss Lakes which belong to the Neolithic age, or to that period when the use of metal was unknown in Europe north of the Alps, and both were probably introduced from the East by the same race of herdsmen to whom we owe the domestic cattle, Horses, and Dogs, as well as the arts of gardening, farming, and spinning. The amount of change which has been produced by the art of man in modifying the original stock may be estimated from the figure at the top of the preceding page.

THE SOLID-HOOFED BREED OF PIGS.—Among the most remarkable breeds of Pigs under domestication, the Solid-hoofed Pigs deserve special notice, because they show a persistent variation from the even-toed type. “From the time of Aristotle,” writes Mr. Darwin, “to the present time, solid-hoofed Swine have been occasionally observed in various parts of the world. Although this peculiarity is strongly inherited, it is hardly probable that all the animals with solid hoofs have descended from the same parents; it is more probable that the same peculiarity has reappeared at various times and places. Dr. Struthers has lately described and figured the structure of the feet; in both front and hind feet the distal phalanges of the two greater toes are represented by a single, great, hoof-bearing phalanx; and in the front feet, the middle phalanges are represented by a bone which is single towards the lower end, but bears two separate articulations towards the upper end.”



BONES OF PIG’S FOOT.



FOOT OF SOLID-HOOFED PIG. (*After Coues.*)
The hoof, *e*, is withdrawn sufficiently to show the joints.

This singular modification is stated by Dr. Coues to be persistent in a Texas breed. So far as the hoof is concerned the animal is perfectly solid-ungulate. It is also perfectly “odd-toed” (or perissodactyle) in the terminal phalanges, which are joined together so as to form one single hoof-supporting bone, *a* of figure. Above this, however, the other two phalanges (*b*, *c*) remain separate, and are widely separated from each other by the intervention of a special ossicle (*d*). How far this departs from the normal type may be seen from the comparison of the figure with that of the foot of the Common Hog.

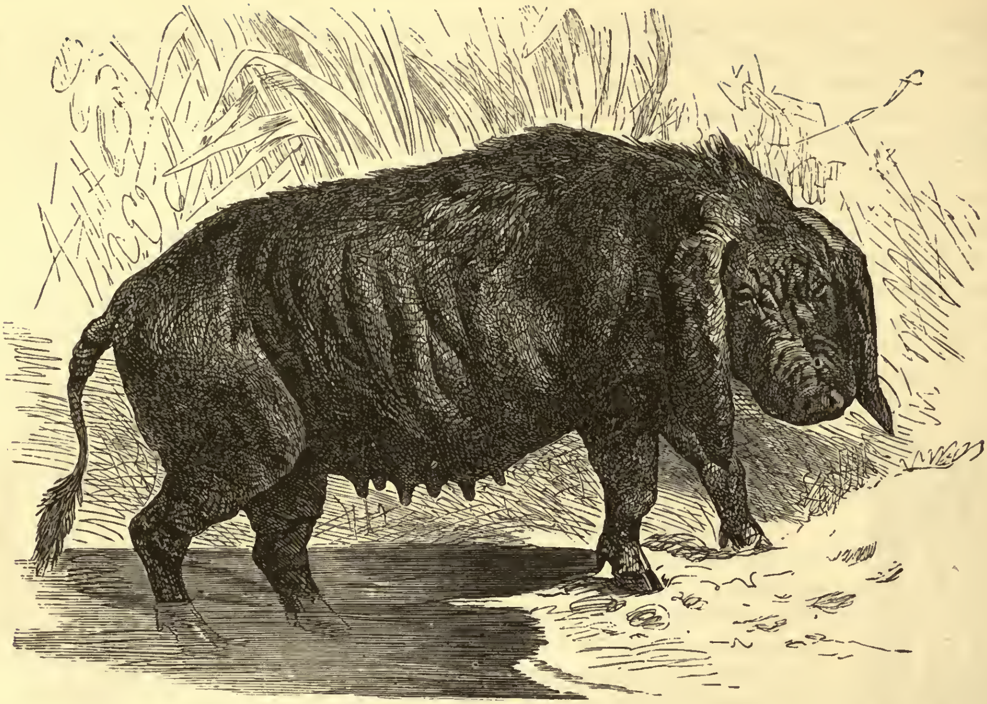
Among the aberrant forms resulting from domestication, according to Nathusius, is the JAPAN, OR MASKED PIG (*S. pliciceps*, Gray), with its short head, broad forehead and nose, great fleshy ears, and deeply-furrowed skin, of which the great thick folds are compared by Mr. Darwin to the plates on the Indian Rhinoceros. It is held by Nathusius to belong to the same stock as the Chinese Pig, a view which is by no means improbable if we consider the enormous differences which are produced by the selection of characters under the care of man in the European breeds.

The Hogs are represented in Africa, south of the Sahara, and in Madagascar, by an animal known as the BUSH HOG (*Potamochœrus*), which possesses a remarkable boss or excrescence, rising from the face below the eyes. The species figured, the *Potamochœrus penicillatus*, has peculiar ears which look almost as if they had been cut.

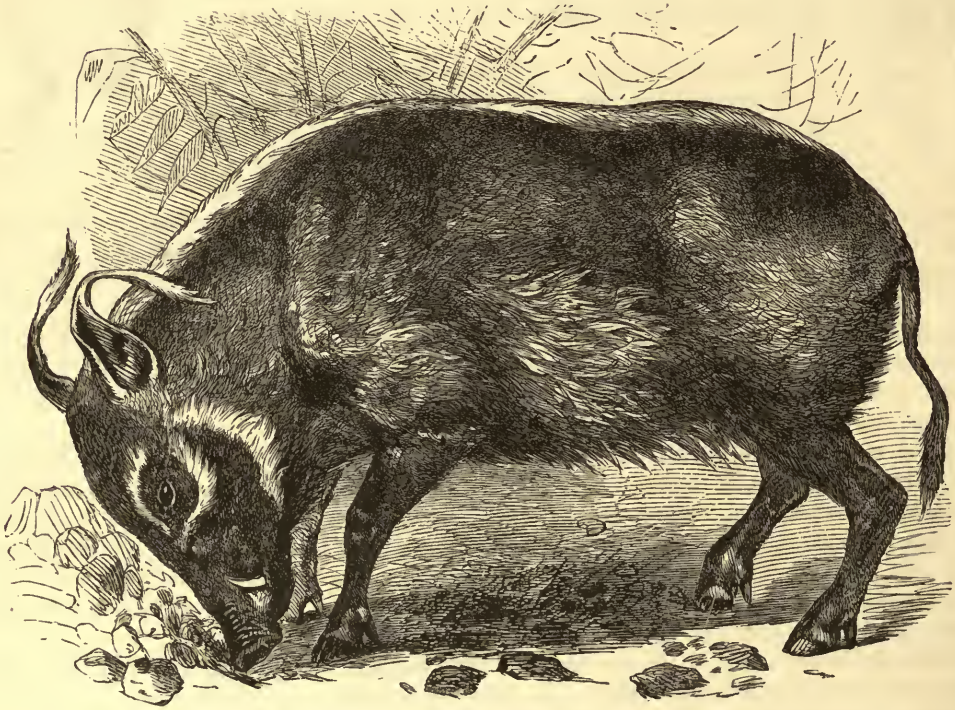
One of the most singular of the Wild Hogs is the BABIRUSA (*Porcus babirusa*), inhabiting the islands of Celebes and Borneo, in which, in the males, the tusks arrive at an enormous size, those of the upper jaw curving upwards and backwards, and even, in some cases, penetrating the skull in their backward reach. These tusks, however, are useless for purposes of attack. The lower jaws also are armed with two sharp tusks, which are capable of inflicting severe wounds. The animal is nearly hairless, and is said to arrive at a size not much less than that of a Donkey. It is very ferocious, and is a more formidable antagonist than the Wild Boar of Europe.

The name *Babirusa* is said to be a compound of *Baba* and *Rusa*, being the Malayan appellations of the Pig and the Deer respectively.

The Babirusa is described as being of a delicate nature, requiring considerable care and attention when kept in confinement. In its natural state it is said to be very swift, running with the rapidity



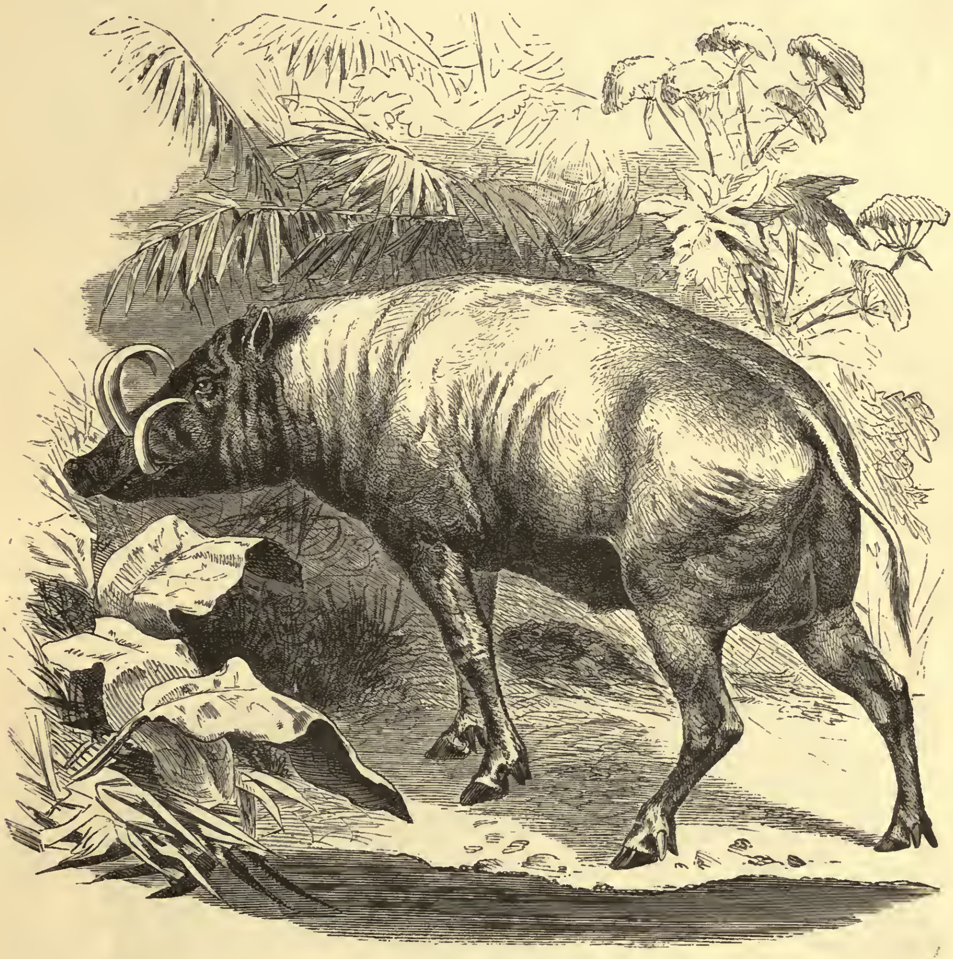
MASKED PIG.



BUSH HOG.

of a Deer, and to be of a fierce disposition. The flesh of this animal is highly prized as an article of food in the countries in which it is found.

The Wart Hogs (*Phacochœrus*) constitute the second well-marked group to be considered under the head of the family of Hogs. They range over tropical Africa from Abyssinia to Caffraria. They are remarkable, not only for having enormous tusks, and for the development of a large excrescence, or wart, under each eye, but also for the peculiar construction of their last grinding teeth. These are massive, and composed of prisms of enamel surrounding a central mass of dentine, and embedded in the cement which unites them into one tooth. There is only one pair of upper incisors, and the last molars are the only ones which are not shed in the old animal. The canines are large, recurved, sharp, and project eight or nine inches beyond the lips.



BABIRUSA.

Two species of this peculiar genus occur in Africa. Ælian's Wart Hog* is a native of the North of Africa. Its skin is of a reddish colour, sparingly supplied with bristles; the neck and back support a mane, some of the bristles of which attain a considerable length.

The Ethiopian Wart Hog (*P. æthiopicus*) is a native of the southern portions of Africa, and differs principally from the preceding in the larger size of the warts, and a more peculiarly shaped head. The food of both species of Wart Hogs appears to consist almost entirely of roots.

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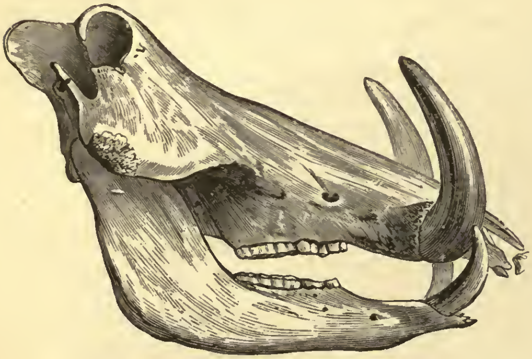
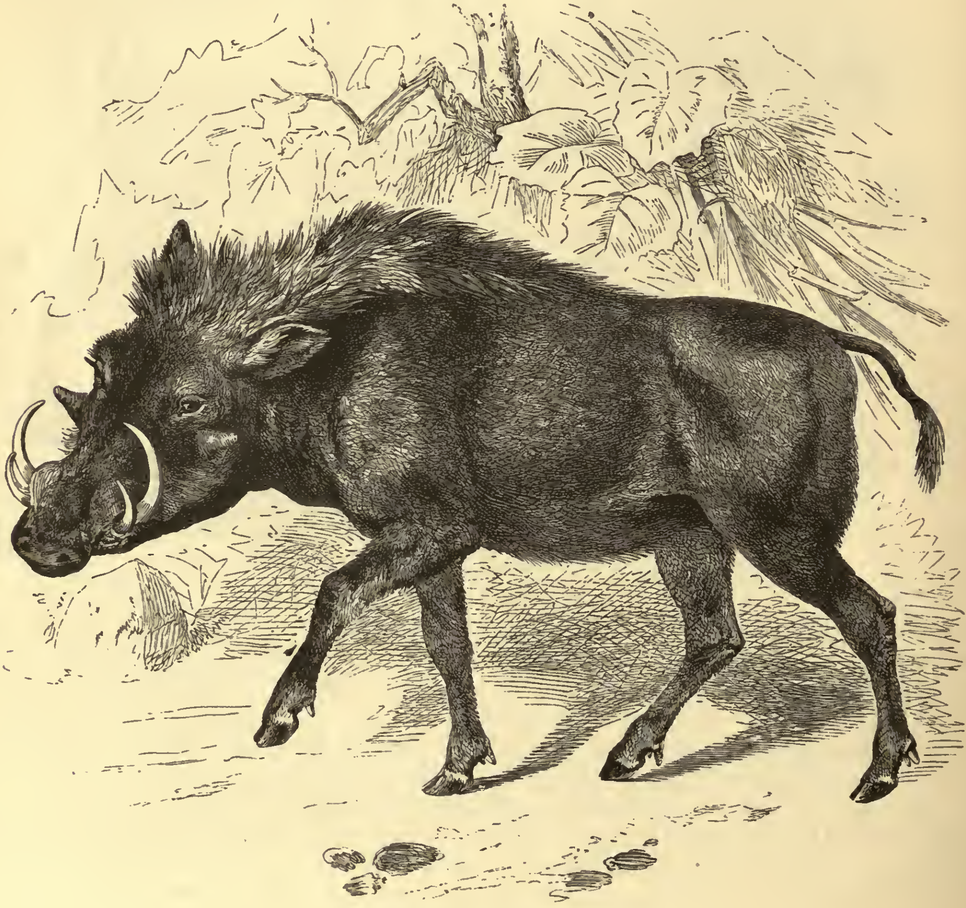
* *Phacochœrus Ælianus.*

The Hog family is represented in the New World by the small though formidable animals known as the PECCARIES (*Dicotyles*), which are not more than about three feet long, and about fifty or sixty pounds in weight. They live in herds, are omnivorous, and are perhaps the most awkward animals to be dealt with by the hunter in the forests of South America. They know no fear, and will attack anything which comes in their way, inflicting frightful wounds with their short, lancet-shaped tusks, which are entirely concealed within their lips. They live in holes and hollow logs, into which they back, one by one, until their abode is full, the last standing as sentinel with his head outside. This habit affords the hunter an easy means of killing them, for if the sentinel be killed outright the next takes his place, after pushing out the dead body, and this may go on until the last of the herd is killed.

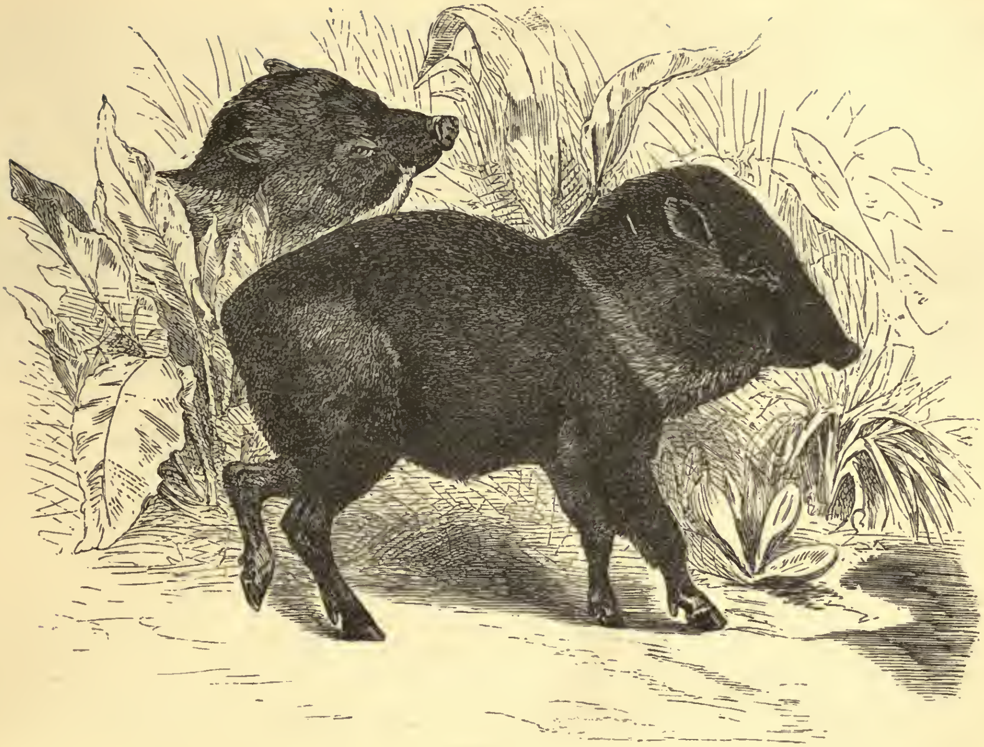


SKULL OF THE ETHIOPIAN WART HOG.

The dentition of the Peccary differs from that of the True Hogs in the smaller number of teeth, which are thirty-eight, instead of forty-four, in number, the upper incisors being reduced to four, and the premolars in the upper and lower jaws being six instead of eight. There are also differences in



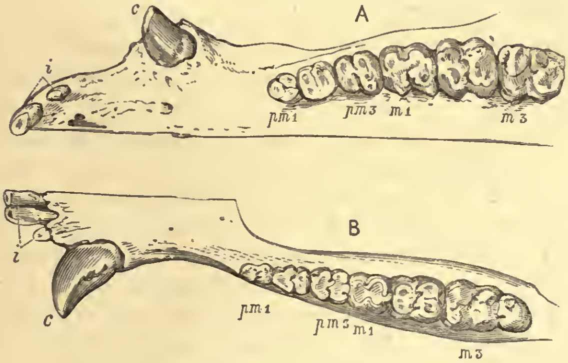
ETHIOPIAN WART HOG.



PECCARY.

the shape of the teeth, the grinders presenting transverse ridges, as may be seen from the comparison of the accompanying figure with that of the Hog.

There is also another important difference to be noted between the Peccaries and the True Hogs in the structure of the feet. In the former, the middle metatarsals and metacarpals unite into a solid cannon bone analogous to that of cattle, while in the latter they are distinct during the whole life of the animal.



DENTITION OF PECCARY. (A, Upper; B, Lower jaw.)

Two species of Peccary are known, the Common, or Tajuca, or Collared Peccary (*Dicotyles torquatus*), which ranges from Texas as far as the Straits of Magellan, and the White-lipped Peccary (*D. labiatus*), of the forests of South America. The latter is the larger of the two, and the more ferocious.

The Fossil Hogs.—The remains of the Fossil Hog are met with in the fossil state in Europe, as far back as the Miocene Age, in which period, as Professor Gaudry has pointed out, the canines were not developed into large tusks in the Hog tribe. In the Pliocene Age the males possessed moderate tusks, and in the Pleistocene, as at the present time, the forests of Europe were haunted by large "tuskers."

HIPPOPOTAMI IN A MEADOW BY THE SENEGAL.

CHAPTER IV.

ARTIODACTYLA—THE HIPPOPOTAMUS FAMILY.

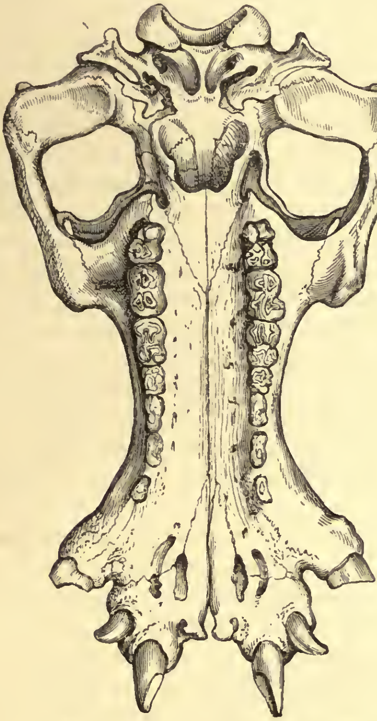
Present Representatives—Two Species—THE COMMON RIVER HORSE—General Appearance—Characteristics: Skin, Head, Nostrils, Eyes, Ears, Legs, Tail, Mouth, Tusks, Dentition, Skeleton, Stomach—Habits—Food—Under Water—Behemoth of the Bible—Used in the Roman Sports—As described by the Ancient Naturalists—As portrayed by the Ancient Artists—The First Hippopotamus in England—Subsequent Inmates of the Zoological Gardens—Herds of Hippopotami—Harpoon for Hunting—Sir Samuel Baker's Accounts of Hippopotamus Hunts—Various Methods of Capture—Occasional Fits of Blind Fury—A Night Attack upon a Diahbeeah—Uses of the Hippopotamus—THE LIBERIAN HIPPOPOTAMUS—Fossil Forms—THE ANOPLOTHERES.

II.—THE HIPPOPOTAMUS FAMILY (HIPPOPOTAMIDÆ).

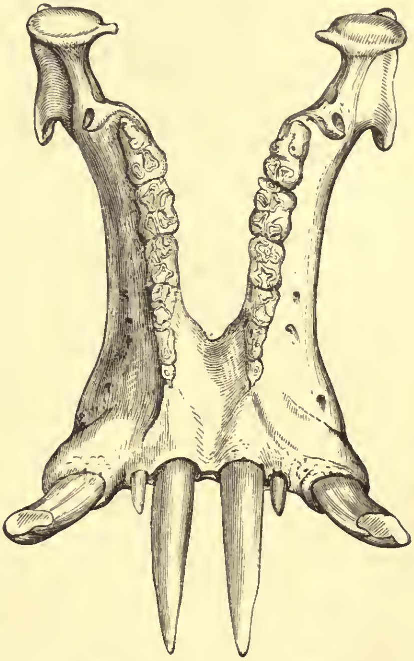
THE Hippopotami, or River Horses, constitute the second family to be considered next after the Hogs, among the non-ruminant hoofed animals possessing an even number of toes on each foot. They are represented at the present time by two closely-allied species found only in Africa, the *Hippopotamus amphibius*, or Common River Horse, which haunts the rivers of Africa from the Sahara desert to the Cape Colony; and the much smaller Liberian animal, living on the west coast and on the rivers flowing into Lake Tchad.

THE COMMON RIVER HORSE (*Hippopotamus amphibius*) is a large, unwieldy-looking animal, sometimes as much as eleven or twelve feet long, with a massive body and enormous head, and short stout legs. Nevertheless, it is capable of moving swiftly on the land and of swimming with perfect ease. Its skin is naked, thick, and penetrated by pores which exude a thick fatty secretion, which may perhaps be useful to it while in the water. The front part of the head is massive, and broader than that of any other living quadruped; the nostrils are comparatively small slits, which are closed and water-tight during the frequent dives beneath the surface of the water; the eyes are prominent, and placed far back in the head; and the ears are so short that they look as if they had been cropped. They, too, have a special arrangement of muscles by which they can be closed. The short legs are terminated by four hoof-bearing toes; and the short tail is adorned with bristles arranged laterally and on opposite sides, which are the only traces of hair found on the animal. The mouth is very large, and armed with tusks and grinders, that present a fearful appearance when the animal opens its mouth with a gape, which is unsurpassed in width by that of any other animal. The tusks are enormous, especially those in the lower jaw, which are curved upwards as in the Hogs, and meet those of the upper jaw close to their sockets. By the attrition of their surfaces together their tips are reduced to a chisel edge. Between these great teeth are four front or incisor teeth, of conical shape, in both upper and lower jaws, those in the latter being the larger. The grinders in each jaw are three in number, and of a trefoil pattern on their worn surfaces; while the false grinders in front of them, four in number in each jaw, are conical, sharp-edged, and resemble those of the Hogs. The skeleton is very Hog-like, and the stomach is divided into four compartments. The liver has a gall-bladder, and the kidneys are divided into lobes.

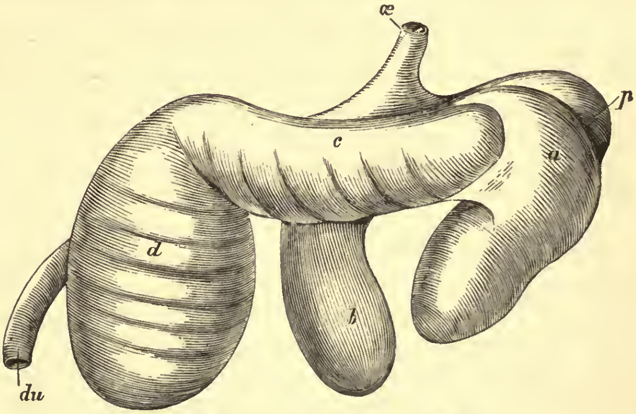
The River Horse is nocturnal in its habits, frequenting rivers and lagoons, and rarely leaving them or their immediate neighbourhood except at night, when it will go considerable distances in search of food, sometimes causing great damage to cultivated crops, which may be estimated from the fact that its stomach is capable of holding from five to six bushels. Its food consists principally of grass, young shrubs, and water plants, and it is particularly fond of green corn. When in the water its slow respiration enables it to remain for a long time beneath the surface without coming up to breathe; and the means of closing both its ears and nostrils against the access of water, before alluded to, is admirably suited for its aquatic habits.



BASE OF SKULL OF HIPPOPOTAMUS, SHOWING DENTITION.



LOWER JAW OF HIPPOPOTAMUS, SHOWING DENTITION.



STOMACH OF HIPPOPOTAMUS. (*After Clark.*)
a b c d, the four divisions in their order; *p*, partition in interior of division; *œ*, œsophagus; *du*, duodenum.

The first and only time in which any animal at all answering the description of the Hippopotamus is mentioned in the Bible is under the designation of Behemoth (Job xl. 15—24), and even then there is room for doubt as to whether the description may not be nearly as applicable to the Elephant, though on the whole it certainly suits the Hippopotamus better.

It is interesting to know that Milton evidently considered Behemoth to mean the Elephant, or, at any rate, not the Hippopotamus, for in "Paradise Lost," in writing of the Creation, he says:—

> "Scarce from his mould
> Behemoth, biggest born of earth, upheaved
> His vastness: fleeced the flocks, and bleating, rose
> As plants: ambiguous between sea and land
> The *river horse* and scaly crocodile."

According to Pliny, the Hippopotamus was first seen in Europe in the curule ædileship of Scaurus, 58 B.C., when the exhibition in the circus surpassed anything the Romans had ever seen. Among other novelties, he exhibited a Hippopotamus and five Crocodiles. But according to Dion Cassius, the Hippopotamus was first shown in the games celebrated by Augustus, 29 B.C. So great was the demand for Hippopotami in the Roman sports at a later period, that according to Marcellinus Ammianus, they had disappeared from Egypt since the time of the Emperor Julian. Favourable circumstances, however, must have again restored them, as we learn, from the accounts given by Zerenghi and others, of their being plentiful about the year 1600 and later. In some parts of Egypt the Hippopotamus seems to have been sacred, as we learn from Herodotus. Sonnini relates that the Hippopotami laid bare whole countries by their terrible ravages, and from the terror they inspired they were generally looked upon as the symbol of Typhon, that giant who spread death and destruction among the deities which were worshipped, and were the emblem of mischance and cruelty, and that the worship of them at Papresius was practised with the view of appeasing and averting their anger.

The descriptions given by early writers of the Hippopotamus are in many instances most ludicrous. Aristotle, borrowing from Herodotus, states that "the Hippopotamus of Egypt has a mane like a Horse, a bifurcated hoof like an Ox, a flat visage or muzzle, an astragalus like the animals with cloven feet, projecting teeth which do not show themselves much, the tail of a Hog, the voice of a Horse, and in size it resembles an Ass. Its skin is of such a thickness that spears are made of it." It is pretty clear from this description that Aristotle meant the Hippopotamus, but also that he never saw one. Diodorus approaches nearer to the truth as to the size of this animal when he says that it is five cubits in length, and that the bulk resembles that of the Elephant. However, he still retains the cloven hoof and Horse's mane. Pliny speaks of it as living in the Nile, and also gives it the bifid hoof of the Ox, the back, mane, and neigh of the Horse, a flattened muzzle, the tail and teeth of the Boar; evidently following the descriptions given of it by Aristotle. He also adds that helmets and bucklers are made of its skin, and that the animal feeds on the crops, and is very cautious in avoiding snares; but he goes on to say that it is covered with hair like the Seals. It is difficult to conceive how he could have fallen into so great an error after having spoken of its being exhibited in Rome by M. Scaurus, with five Crocodiles. He finishes his account by stating that when the animal gets too fat, and is diseased, it bleeds itself by pressing a vein of its leg against some sharp object, and then plastering up the wound with mud, so that it may speedily heal. The ancient artists appear to have been more faithful in their portraits of the Hippopotamus than the ancient authors and naturalists in their descriptions; indeed, with very few exceptions, the animal has been pretty faithfully portrayed. One exception is a figure copied by Hamilton from one of the caves of Beni-Hassan, in which the feet are displayed as cloven, and the lower tusks made to appear so excessively large as to prevent all possibility of their being hidden when the animal closed its jaws. In the figure on the plinth of the statue of the Nile, which was formerly in the Vatican, although the teeth and feet are not correct, the general idea is good; and in many other sculptures and mosaics it is very well represented, also on some of the medals and coins of Roman Emperors: sometimes it is represented as holding a Crocodile in its mouth, which probably may have given rise to the stories of the enmity the Hippopotamus bears towards the Crocodile. In more modern times we have more or less fabulous descriptions given by Isidore of Seville and Vincent de Beauvais, neither of whom appears to have seen the animal. Belon and Gillius, it would seem, are the first of the moderns who actually saw the Hippopotamus alive, and this was at Constantinople, although Sonnini appears to doubt the identity of the animal which Belon saw. This is hardly justifiable, as Belon was a very accurate observer, and even points out with much truth the differences between the one he saw and those he had seen pictured on ancient works of art.

The first Hippopotamus ever seen alive in Great Britain, or indeed in Europe in modern times, was brought to England on the 25th of May, 1850, and placed in the Gardens of the Zoological Society. Mitchell gives the following account of its capture and habits:—"Since the Imperial Exhibitions in the Circus of Rome, no living Hippopotamus has been imported into Europe, except the young male which the Society possesses. The difficulty of obtaining such an animal may be conjectured from the fact that after the Viceroy of Egypt had determined to present one to the Society, it became necessary for his Highness to despatch an expedition to the Upper Nile for the purpose of making the capture, and that success was only achieved after two thousand miles of the river had been ascended. In the month of July, 1849, the chief huntsman of the party, in searching the reedy margin of an island in the White Nile, called Obaysch, at last discovered a little Hippopotamus calf, which, as he conjectured, had been born about two days. It was so small that, in his delight at having accomplished the Pasha's order, he seized it in his arms, and would have carried it to the boat which waited on him, had not the slimy exudation which is lavishly poured forth from innumerable pores in the skin of the young Hippopotamus rendered it so slippery that he was entirely unable to retain his hold. The animal having thus slipped from his grasp, all but escaped into the Nile, where the mother doubtless was lying near at hand. The hunter, however, with the presence of mind which characterises a good sportsman, seized his spear, and with the sharp side-hook, which has been in fashion in Egypt for three thousand years or more, he succeeded in arresting the headlong plunge of his prize, without inflicting greater injury upon him than a skin wound, the scar of which he bore to the day of his death. The long voyage down the river was successfully accomplished in a boat which had been built for the purpose by the Viceroy's order, and 'Obaysch,' as they named the Hippopotamus, from his birthplace, was safely delivered in November, 1849, after a journey of four months, into the care of the Hon. C. A. Murray, through whose powerful influence the Viceroy had been prevailed upon to exert his power and assist the Society in an object for which all exertions of their own had failed. Obaysch spent his first winter in Cairo, under the charge of his intelligent keeper, Hamet Saaffi Canaana, a Nubian Arab, whom Mr. Murray engaged for the purpose. In May, 1850, proper preparations were made, with the obliging co-operation of the directors, in the Peninsular and Oriental Steam Navigation Company's ship *Ripon*, for the transport from Alexandria, and on the 25th of that month the first Hippopotamus which had breathed on English soil within this period of history was landed successfully on the quay at Southampton, and liberated in the Gardens from his travelling-house at ten o'clock the same evening. On emerging from the door of it he followed Hamet, who had scarcely ever left him during the whole voyage from Cairo, into the building which had been prepared for him, and instantly indulged in a long-continued bath. The ten hours which elapsed between his removal from the steamer at Southampton, and his arrival in the Regent's Park, is the longest period during which he has ever been without access to water."

For the first year Obaysch was fed almost entirely on Cow's milk and finely-ground Indian corn, and as he grew older he consumed about 100 lbs. weight of hay, chaff, corn, roots, and green food a day. He rapidly grew, until he reached the enormous weight of about four tons, and he was one of the chief attractions of the Gardens at the time of his death in March, 1878.

In 1853 a young female, Adhela, was obtained from the same district, and in the spring of 1871 the first calf was born, and a second in January, 1872, both of which were lost shortly after their birth, in spite of every care and precaution. The third was born on the 5th of November, 1872, and called "Guy Fawkes," and has been successfully reared. Little Guy Fawkes sucked freely shortly after its birth, and has continued to thrive up to the present time, now rivalling her mother in size. When she chooses to disport herself in her huge tank, her vast bulk and enormous gape combine to keep the crowd of onlookers in a proper state of subjection not unmixed with awe.

Hippopotami roam together in herds, and where they have not been disturbed come fearlessly to the top of the water, often lazily basking on the surface, and on the banks; but in places where they have been hunted and shot at they become very wary, and content themselves by just showing their noses among weeds, and sometimes they are so carefully concealed that but for their footprints on the bank of the river their presence would be unsuspected. Cumming, in his African hunting experiences, gives a description of seeing an entire colony of these animals on the banks of the Limpopo. He says:—"Presently in a broad and deeply shaded pool of the river we heard the Sea Cows bellowing, and on approaching somewhat nearer beheld a wonderful and interesting sight. On a sandy promontory of the island stood about thirty cows and calves, whilst in the pool opposite and a little below them stood about twenty more Sea Cows, with their heads and backs above water. About fifty yards farther down the river, again showing out their heads, were eight or ten immense fellows, which I think were all bulls, and about a hundred yards below these, in the middle of the stream, stood another herd of eight or ten cows with calves, and two large bulls. The Sea Cows lay close together like Pigs, and as they sprawl in the mire have not the least objection to their neighbours pillowing their heads on their backs and sides."

COMMON HIPPOPOTAMUS.

Livingstone also gives a description of seeing a herd of Hippopotami as follows:—"On a shallow sand bank, under a dyke crossing the River Zambesi near the mouth of the Sinjere, lay a

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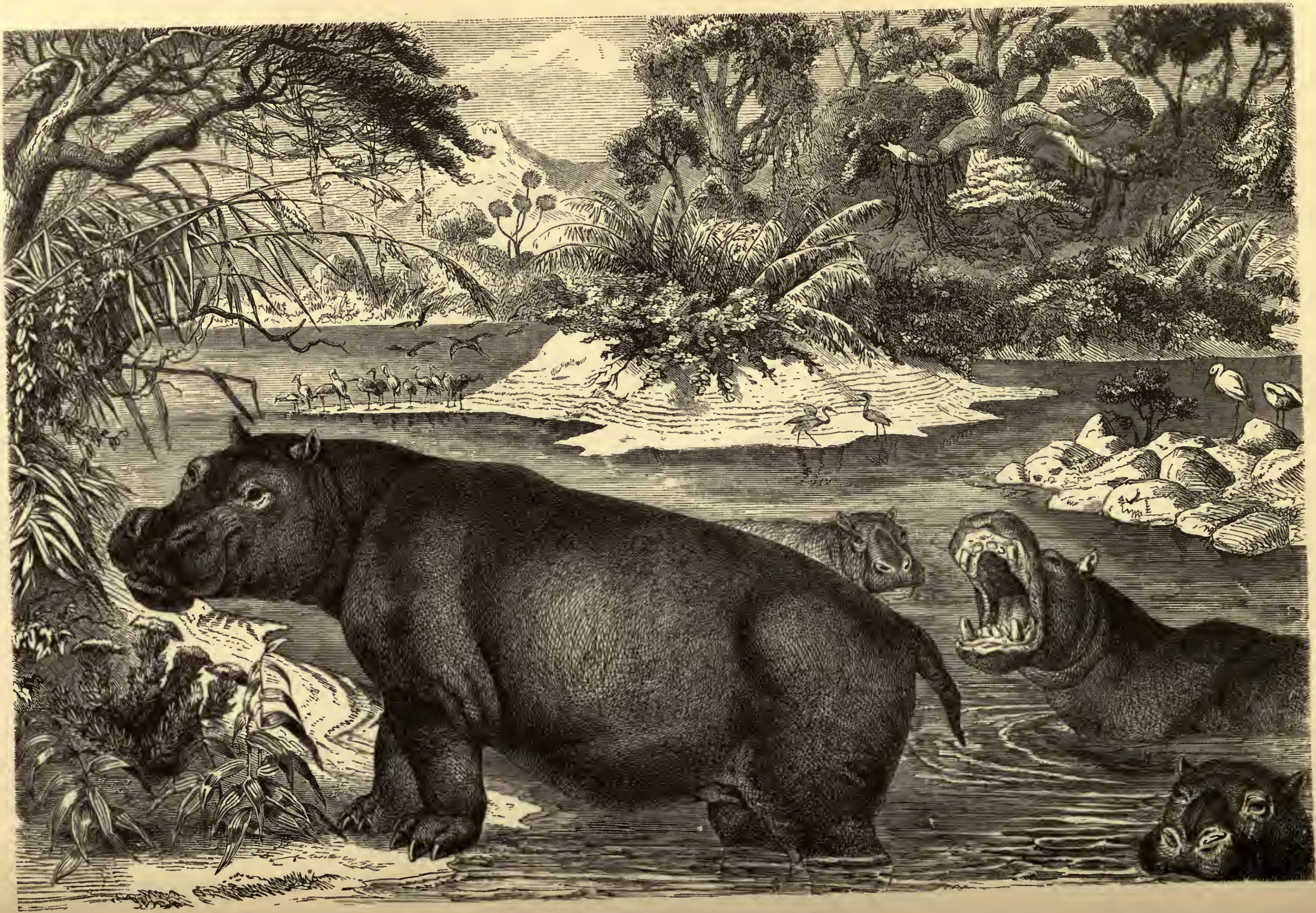


HIPPOPOTAMUS.

herd of Hippopotami in fancied security. The young ones were playing with each other like young puppies, climbing on the backs of their dams, trying to take hold of one another by the jaws, and tumbling over into the water. Mbia, one of the Makotols, waded across to within a dozen yards of the drowsy beasts, and shot the father of the herd, who being very fat soon floated, and was secured at the village below. The men then gorged themselves with meat for two days, and cut large quantities into long narrow strips, which they half dried and half roasted on wooden frames over the fire."

The harpoon is the weapon usually used by the natives of Africa for catching the Hippopotamus. One kind of harpoon consists of a shaft about twelve feet long, at one end of which is a combination of spear and fish-hook, the spear being let into a socket of the shaft, and also attached to the shaft by means of cords. At the other extremity is a coil of rope, to which is attached a large float, so that when a Hippopotamus is harpooned the float shows the position of the animal. When an animal is struck, it is followed either by men in canoes or on land, who by means of ropes get possession of the line to which the float is attached, which they entwine round a tree, and every time the animal comes up to breathe he is greeted with a shower of spears until finally finished.

HUNTING HIPPOPOTAMI WITH THE HARPOON.

Livingstone in his "African Travels" gives the following interesting account of this instrument and its makers. He relates that on the Zambesi River "beyond Pita lies the little island Nyamotobsi, where we met a small fugitive tribe of Hippopotamus hunters, who had been driven by war from their own island in front. With the civility so common among them, the chief ordered a mat to be spread for us under a shed, and then showed us the weapon with which they kill the Hippopotamus. It is a short iron harpoon inserted in the end of a long pole, but being intended to unship, it is made fast to a strong cord of milola, or hibiscus bark, which is wound closely round the entire length of the shaft, and secured at its opposite end. Two men in a swift canoe steal quietly down on the sleeping animal. The bowman dashes the harpoon into the unconscious victim, while the quick steersman sweeps the light craft back with his broad paddle. The force of the blow separates the harpoon from its corded handle, which, appearing on the surface, sometimes with an inflated bladder attached, guides the hunters to where the wounded beast hides below until they despatch it." Livingstone then goes on to say:—"These Hippopotamus hunters form a separate people called Akombwi, or Mapodzo, and rarely—the women, it is said, never—intermarry with any other tribe. The reason for their keeping aloof from certain of the natives of the Zambesi is obvious enough, some having as great an abhorrence of Hippopotamus meat as Mohammedans have of swine's flesh. Our pilot, Scissors, was one of this class; he would not even cook his food in a pot which had contained Hippopotamus meat, preferring to go hungry until he could find another, and yet he traded eagerly in the animals' tusks, and ate with great relish the flesh of the foul-feeding Marabout."

Sir Samuel Baker relates from personal observation the capture of a Hippopotamus with the harpoon above described. He says:—"At length we arrived at a large pool, in which were several sand-banks covered with rushes, and many rocky islands. Among these rocks was a herd of Hippopotami, consisting of an old bull and several cows; a young Hippo was standing, like an ugly little statue, on a protruding rock, while another infant stood upon its mother's back that listlessly floated on the water. This was an admirable place for the hunters. They desired me to lie down, and they crept into the jungle out of view of the river. I presently observed them stealthily descending the dry bed about two hundred paces above the spot where the Hippos were basking behind the rocks. They entered the river, and swam down the centre of the stream towards the rock. This was highly exciting. The Hippos were quite unconscious of the approaching danger, as steadily and rapidly the hunters floated down the strong current; they neared the rock, and both heads disappeared as they purposely sank out of view; in a few seconds later they reappeared at the edge of the rock upon which the young Hippo stood. It would be difficult to say which started first, the astonished young Hippo into the water, or the harpoons from the hands of the howartis! It was the affair of a moment. The hunters dived directly they had hurled their harpoons, and swimming for some distance under water, they came to the surface, and hastened to the shore lest an infuriated Hippopotamus should follow them. One harpoon had missed; the other had fixed the bull of the herd, at which it had been surely aimed.

"This was grand sport! The bull was in the greatest fury, and rose to the surface, snorting and blowing in his impotent rage; but as the ambatch float was exceedingly large, and this naturally accompanied his movements, he tried to escape from his imaginary persecutor, and dived constantly, only to find his pertinacious attendant close to him upon regaining the surface. This was not to last long. The howartis were in earnest, and they at once called their party, who, with two of the aggageers, Abou Do and Suleiman, were near at hand. These men arrived with long ropes that form a portion of the outfit for Hippo hunting. The whole party now halted on the edge of the river, while two men swam across with one end of the long rope. Upon gaining the opposite bank, I observed that a second rope was made fast to the middle of the main line; thus upon our side we held the ends of two ropes, while on the opposite side they had only one. Accordingly, the point of junction of the two ropes in the centre formed an acute angle. The object of this was soon practically explained. Two men upon our side now each held a rope, and one of these walked about ten yards before the other. Upon both sides of the river the people now advanced, dragging the rope on the surface of the water until they reached the ambatch float that was swimming to and fro, according to the movements of the Hippopotamus below. By a dexterous jerk of the main line the float was now placed between the two ropes, and it was immediately secured in the acute angle by bringing together the ends of these ropes on our side. The men on the opposite bank now dropped their line, and our men now hauled in upon the ambatch float that was held fast between the ropes. Thus cleverly made sure, we quickly brought a strain upon the Hippo; and although I have had some experience in handling big fish, I never knew one pull so lustily as the amphibious animal that we now alternately coaxed and bullied.

"He sprang out of the water, gnashed his huge jaws, snorted with tremendous rage, and lashed the river into foam; he then dived, and foolishly approached us beneath the water. We quickly gathered in the slack line, and took a round turn upon a large rock within a few feet of the river.

"The Hippo now rose to the surface about ten yards from the hunters, and jumping half out of the water, he snapped his great jaws together, endeavouring to catch the rope, but at the same instant two harpoons were launched into his side.

"Disdaining retreat, and maddened with rage, the furious animal charged from the depths of the river, and gaining a footing, he reared his bulky form from the surface, came boldly upon the sand-bank, and attacked the hunters open-mouthed. He little knew his enemy: they were not the men to fear a pair of gaping jaws, armed with a deadly array of tusks, but half a dozen lances were hurled at him, some entering his mouth from a distance of five or six paces; at the same time several men threw handfuls of sand into his enormous eyes. This baffled him more than the lances: he crunched the shafts between his powerful jaws like straws, but he was beaten by the sand, and, shaking his huge head, he retreated to the river. During his sally upon the shore, two of the hunters had secured the ropes of the harpoons that had been fastened in his body just before his charge. He was now fixed by three of these deadly instruments; but suddenly one rope gave way, having been bitten through by the enraged beast, who was still beneath the water. Immediately after this he appeared on the surface, and without a moment's hesitation, he once more charged furiously from the water straight at the hunters, with his huge mouth open to such an extent that he could have accommodated two inside passengers. Suleiman was wild with delight, and springing forward lance in hand, he drove it against the head of the formidable animal, but without effect. At the same time, Abou Do met the Hippo sword in hand, reminding me of Perseus slaying the sea-monster that would devour Andromeda; but the sword made a harmless gash, and the lance, already blunted against the rocks, refused to penetrate the tough hide. Once more handfuls of sand were pelted upon his face, and again repulsed by this blinding attack, he was forced to retire to his deep hole, and wash it from his eyes. Six times during the fight the valiant bull Hippo quitted his watery fortress, and charged resolutely at his pursuers; he had broken several of their lances in his jaws; other lances had been hurled, and falling upon the rocks, they were blunted and would not penetrate. The fight had continued for three hours, and the sun was about to set; accordingly the hunters begged me to give him the *coup de grâce*, as they had hauled him close to the shore, and they feared he would sever the rope with his teeth. I waited for a good opportunity, when he boldly raised his head from the water about three yards from the rifle, and a bullet from the little Fletcher between the eyes closed the last act."

Another interesting account is also given by Sir S. Baker of the capture of a Hippopotamus by means of the spear. The description conveys a good idea of the habits and wariness of these animals.

"Hippopotami had trodden a path along the margin of the river, as these animals came out to feed, shortly after dark, and travelled from pool to pool. Wherever a plot of tangled and succulent herbage grew among the shady nabbuks, there were the marks of the harrow-like teeth, that had torn and rooted up the rank grass like an agricultural implement.

"After walking about two miles, we noticed a herd of Hippopotami, in a pool below a rapid, where the rush of water had thrown up a bank of pebbles and sand. Our old Neptune did not condescend to bestow the slightest attention when I pointed out these animals—they were too wide awake; but he immediately quitted the river's bed, and we followed him quietly behind the fringe of bushes upon the border, from which we carefully examined the water.

"About half a mile below this spot, as we clambered over the intervening rocks through a gorge which formed a powerful rapid, I observed, in a small pool just below the rapid, an immense head of a Hippopotamus close to a perpendicular rock that formed a wall to the river, about six feet above the surface. I pointed out the Hippo to old Abou Do, who had not seen it. At once the gravity of the old Arab disappeared, and the energy of the hunter was exhibited as he motioned us to remain, while he ran nimbly behind the thick screen of bushes for about a hundred and fifty yards below the spot where the Hippo was unconsciously basking, with his ugly head above the surface. Plunging into the rapid torrent, the veteran hunter was carried some distance down the stream, but breasting the powerful current, he landed upon the rocks on the opposite side, and retiring some distance from the river, he quickly advanced towards the spot beneath which the Hippopotamus was lying. I had a fine view of the scene as I was lying concealed exactly opposite the Hippo, who had disappeared beneath the water. Abou Do now stealthily approached the ledge of rock beneath which he had expected to see the head of the animal; his long sinewy arm was raised, with the harpoon ready to strike, as he carefully advanced. At length he reached the edge of the perpendicular rock. The Hippo had vanished, but far from exhibiting surprise, the old Arab remained standing on the sharp ledge, unchanged in attitude. No figure of bronze could have been more rigid than that of the old river king, as he stood erect upon the rock, with the left foot advanced, and the harpoon poised in his ready right hand, above his head, while in the left he held the loose coils of rope attached to the ambatch buoy. For about three minutes he stood like a statue, gazing intently into the clear and deep water beneath his feet. I watched eagerly for the reappearance of the Hippo. The surface of the water was still barren, when suddenly the right arm of the statue descended like lightning, and the harpoon shot perpendicularly into the pool with the speed of an arrow. What water fiend answered to the summons? In an instant an enormous pair of open jaws appeared, followed by the ungainly head and form of the furious Hippopotamus, who, springing half out of the water, lashed the river into foam, and, disdaining the concealment of the deep pool, he charged straight up the violent rapids. With extraordinary power he breasted the descending stream; gaining a footing in the rapids, about five feet deep, he ploughed his way against the broken waves, sending them in showers of spray upon all sides, and upon gaining broader shallows he tore along through the water, with the buoyant float hopping behind him along the surface, until he landed from the river, started at full gallop along the dry shingly bed, and at length disappeared in the thorny nabbuk jungle.

HIPPOPOTAMI AT THE FALLS OF THE RIVER SENEGAL.

"I never could have imagined that so unwieldy an animal could have exhibited such speed; no man would have had a chance of escape, and it was fortunate for our old Neptune that he was secure upon the high ledge of rock, for if he had been in the path of the infuriated beast, there would have been an end of Abou Do.

"The old man plunged into the deep pool just quitted by the Hippo, and landed upon our side, while in the enthusiasm of the moment I waved my cap above my head, and gave him a British cheer as he reached the shore. His usually stern features relaxed into a grim smile of delight; this was one of the moments when the gratified pride of the hunter rewards him for any risks. I congratulated him on his dexterity; but much remained to be done. I proposed to cross the river, and to follow upon the tracks of the Hippopotamus, as I imagined that the buoy and rope would catch in the thick jungle, and that we should find him entangled in the bush; but the old hunter gently laid his hand upon my arm, and pointed up the bed of the river, explaining that the Hippo would certainly return to the water after a short interval.

"In a few minutes later, at the distance of nearly half a mile, we observed the Hippo emerge from the jungle, and descend at full trot to the bed of the river, making direct for the first rocky pool, in which we had noticed the herd of Hippopotami. Accompanied by the old howarti (Hippo hunter), we walked quickly towards the spot; he explained to me that I must shoot the harpooned Hippo, as we should not be able to secure him in the usual method by ropes, as nearly all our men were absent from camp, disposing of the dead Elephants. Upon reaching the pool, which was about a hundred and thirty yards in diameter, we were immediately greeted by the Hippo, who snorted and roared as we approached, but quickly dived, and the buoyant float ran along the surface, directing his course in the same manner as the cork of a trimmer with a pike upon the hook. Several times he appeared, but as he invariably faced us, I could not obtain a favourable shot; I therefore sent the old hunter round the pool, and he, swimming the river, advanced to the opposite side, and attracted the attention of the Hippo, who immediately turned towards him. This afforded me a good chance, and I fired a steady shot behind the ear, at about seventy yards, with a single-barrelled rifle. He disappeared beneath the water at the shot. The crack of the ball and the absence of any splash from the bullet told me that he was hit; the ambatch float remained perfectly stationary upon the surface. I watched it for some minutes; it never moved. Several heads of Hippopotami appeared and vanished in different directions, but the float was still; it marked the spot where the grand old bull lay dead beneath."

In addition to the ordinary means of harpooning, a harpoon is also used as a sort of trap, it being well known to the hunters that the Hippopotamus has certain roads or tracks which it habitually uses, preferring a quiet gully with tall trees and grass overhanging. The hunter finding such a road prepares a harpoon within six feet of a moderate-sized tree-trunk, to which he attaches heavy stones. Having found a suitable tree overhanging the path of the Hippopotamus, he throws the rope which is attached to the shaft of the harpoon round a branch, and hauls up his weighted instrument, having done which he drives a stake on one side of the path and turns the rope round it. He then drives another stake on the other side of the path, stretches his rope across, and fastens it to the other stake. The unsuspecting animal, taking his usual evening stroll, strikes his foot against the rope, which dislodging the stakes, the harpoon comes thundering down and the Hippopotamus is transfixed, to be found in the morning by the trapper, probably dead or dying, a long way from the scene of the trap.

Livingstone gives an account in his "African Travels" of a Hippopotamus captured by means of this trap, of whose working he was himself an eye-witness. He says that "both banks of the River Zambesi near the Mboma village are dotted with Hippopotamus traps, over every track which these animals have made in going up out of the water to graze. The Hippopotamus feeds on grass alone, and where there is any danger only at night. Its enormous lips act like a mowing-machine, and form a path of short-cropped grass as it feeds. We never saw it eat aquatic plants or reeds. The tusks seem weapons of both offence and defence. The Hippopotamus trap consists of a beam five or six feet long, armed with a spear-head, or hard-wood spike covered with poison, and suspended to a forked pole by a cord, which, coming down to the path, is held by a catch, to be set free when the beast treads on it. Being wary brutes, they are still very numerous. One got frightened by the ship as she was steaming close to the bank. In its eager hurry to escape it rushed on shore, and ran directly under a trap, when down came the heavy beam on its back, driving the poisoned spear-head a foot deep into its flesh. In its agony it plunged back into the river, to die in a few hours, and afterwards furnish a feast for the natives. The poison on the spear-head does not affect the meat, except the part around the wound, and that is thrown away. In some places the descending beam is weighted with heavy stones, but here the hard heavy wood is sufficient."

The Hippopotamus is also captured by means of pitfalls placed in the animal's tracks. The mouth of the pit is carefully concealed by means of boughs of trees, grass, rushes, &c. Usually two and sometimes three of these pits are dug in close proximity to each other, the extreme wariness of the Hippopotamus causing it to be suspicious of danger, and whilst carefully avoiding one trap it falls into another.

Sometimes these pits catch a very different kind of animal from that for which they were intended. A good story is told in a book of African travels of a Frenchman who had the misfortune to fall into one, and after spending the whole of the morning in getting out, whilst congratulating himself on his success, and brushing off the mud, he tumbled into another close by, from which he did not escape until late in the evening.

The Hippopotamus has been considered by travellers and naturalists to be of a mild and inoffensive disposition, retiring and shy in its habits, and unless provoked rarely attacking man. Probably this to a great extent is true of the animal, but numerous instances are recorded of most ferocious and quite unprovoked attacks, and when this is the case few animals are capable of showing such blind rage.

Canoes are sometimes overturned and crunched between the jaws of this powerful animal without any apparent reason, and even on dry land it occasionally attacks man. Sir S. Baker relates an account of a bull Hippopotamus attacking the proprietor of a melon-garden, and killing him by one crunch of his huge jaws; and Dr. Moffat, the father-in-law of Livingstone, speaks of a man being literally bitten in half by one which chased him on dry land. The Hippopotamus does not seem at all particular as to the size or nature of the objects it assaults, several instances having been recorded of its charging steamers. Sir S. Baker gives the following account of one of these onslaughts on the *Bahir Giraffe*:—"At one p.m., as we were steaming easily, I happened to be asleep on the poop-deck, when I was awakened by a shock, succeeded by the cry, 'The ship's sinking!' A Hippopotamus had charged the steamer from the bottom, and had smashed several floats off her starboard paddle. A few seconds later he charged our diahbeeah, and striking her bottom about ten feet from the bow, he cut two holes through the iron plates with his tusks. On examination two clean holes were found punched through the iron as though driven by a sharp pickaxe."

Another attack of this kind is also related by Sir S. Baker in a lake communicating with the White Nile, which for ferocity and pertinacity is probably unequalled. He says:—"The night was cold, and the moon clear and bright. Every one was wrapped up in warm blankets, and I was so sound asleep that I cannot describe more, until I was suddenly awoke by a tremendous splashing quite close to the diahbeeah, accompanied by the hoarse wild snorting of a furious Hippopotamus. I jumped up, and immediately perceived a Hippo, which was apparently about to attack the vessel. The main deck being crowded with people sleeping beneath their thick Mosquito-curtains, attached to the stairs of the poop-deck, and to the rigging in all directions, rendered it impossible to descend. I at once tore away some of the ties, and awakened the sleeping people. My servant, Suleiman, was sleeping next to the cabin door. I called to him for a rifle. Before the affrighted Suleiman could bring the rifle the Hippopotamus dashed at us with indescribable fury. With one blow he capsized and sank the zinc boat with its cargo of flesh. In another instant he seized the dingy in his immense jaws, and the crash of splintered wood betokened the complete destruction of my favourite boat. By this time Suleiman appeared from the cabin with an unloaded gun in his hand, and without ammunition. This was a very good man, but he was never overburdened with presence of mind; he was shaking so fearfully with nervousness, that his senses had entirely forsaken him. All the people were shouting and endeavouring to scare the Hippo, which attacked us without ceasing, with a blind fury that I have never witnessed in any animal except a Bulldog.

"By this time I had procured a rifle from the cabin, where they were always kept fixed in a row, loaded and ready for action, with bags of breech-loading ammunition on the same shelf. The movements of the animal were so rapid, as he charged and plunged alternately beneath the water in a cloud of foam and wave, that it was impossible to aim correctly at the small but fatal spot upon the head.

"The moon was extremely bright, and presently, as he charged straight at the diahbeeah, I stopped him with a No. 8 Reilly shell. To my surprise, he soon recovered, and again commenced the attack. I fired shot after shot at him without apparent effect.

"The diahbeeah rocked upon the waves raised by the efforts of so large an animal; this movement rendered the aim uncertain. At length, apparently badly wounded, he retired to the high grass; there he lay by the bank, at about twenty-five yards' distance, snorting and blowing. I could not distinguish him, as merely the head was above water, and this was concealed by the deep shadow thrown by the high grass. Thinking he would die, I went to bed; but before this, I took the precaution to arrange a white paper sight upon the muzzle of my rifle, without which night shooting is very uncertain. We had fallen asleep; but in about half an hour we were awoke by another tremendous splash, and once more this huge beast came charging directly at us as though unhurt. In another instant he was at the diahbeeah; but I met him with a ball in the top of his head which sent him rolling over and over, sometimes on his back, kicking with his four legs above the surface, and again producing waves which rocked the diahbeeah. In this helpless manner he rolled for about fifty yards down the stream, and we all thought him killed.

"To our amazement he recovered, and we heard him splashing as he moved slowly along the river through the high grass by the left bank. Ultimately he was killed, and on making a *post-mortem* the following morning, I found he had received three shots in the flank and shoulder, four in the head, one of which had broken his lower jaw, and another had passed through his nose, and passing downward, had cut off one of his large tusks."

The uses to which the Hippopotamus can be applied cannot be considered as many; certainly the flesh is much eaten by the natives of Africa, and even by Europeans it is not to be despised, although travellers seem to disagree as to its merits. Cumming says the flesh is excellent eating, and Baker appears to agree with him, while Dr. Livingstone speaks of it as being pretty good food when one is hungry and can get nothing better, and that it is a coarse-grained meat, having something of the flavour between pork and beef. Probably the Hippopotamus is of considerable use in clearing the rivers of huge water-plants, which abound in African rivers, and which might otherwise in time so choke them up as to convert them from running streams to little else than swamps.

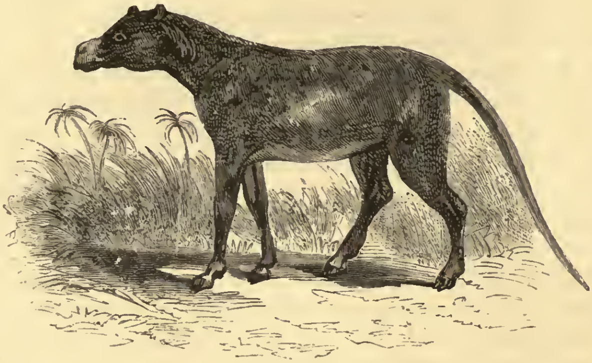
The whips made of Hippopotamus hide are in much request, and are highly esteemed in the neighbouring countries for their elasticity and durability; but the parts of the Hippopotamus most in request, especially by dentists, are the canine teeth, no other ivory keeping its colour so well.

THE LIBERIAN HIPPOPOTAMUS.—The second living species of Hippopotamus (*H. liberiensis*) is a much smaller animal than the common Hippopotamus; according to Dr. Morton, not being larger than a middle-sized heifer, though possessing the relative proportions of the common species. It rarely attains a weight exceeding four hundred pounds, or a quarter of a ton, as distinguished from the four tons' weight of Obaysch of whom we have already spoken. One of the more important differences between them consists in the fact that the Liberian Hippopotamus possesses only two incisors in the lower jaw. A young animal belonging to this species was brought over to Great Britain in 1873, and is stated by Dr. Sclater to have been obtained on the West Coast, from the little Scarcies River. Unfortunately it died shortly after its arrival at the Zoological Gardens in Dublin.

The Hippopotamus ranged in the later Tertiary period far beyond its present home in the African rivers. In the Pliocene age it was very abundant in Italy, and has been met with as far north as Norfolk and Suffolk. In the succeeding, or Pleistocene age, also, it haunted the rivers of France and of England, having been found from the valley of the Ribble northwards. Its remains are from time to time dredged up from the bottom of the German Ocean, and are met with in the dens of Hyænas, as, for example, at Kirkdale, under conditions which prove that it fell a prey to the wild beasts then inhabiting the country. Strange to say, remains of this animal, now flourishing only under a tropical climate, are met with side by side with the remains of the Reindeer, which now flourishes only in a cold temperature, under circumstances which compel us to believe that both animals were living in the same region at approximately the same time. This singular fact can only be accounted for on the supposition that in those days the summer heat was great, and the winter cold severe, such as we find to be the case in Central Asia. These climatic extremes would allow of the same district being inhabited by these animals at different seasons of the year.

An extinct species of Hippopotamus (*Hexaprotodon*), which is characterised by the possession of six instead of four incisors in the upper and lower jaws, lived also in India in the later Tertiary age.

We have seen that at the present time Africa is inhabited by two kinds of Hippopotami, respectively of large and small size. We have also seen that in the Pleistocene age the larger animal inhabited Europe. It is a singular fact that abundant remains of a smaller fossil species, or Pentland's Hippopotamus, should abound in the bone caves of Sicily, and that this dwarfed species should range from that island to Malta, Crete, and the Morea. It is closely allied to the Liberian species, although it is pretty clear that it differed from it in certain details, such as in the form of its molar teeth. A small species of Hippopotamus has been found fossil in Madagascar.



ANOPLOTHERE RESTORED.

THE ANOPLOTHERES (ANOPLOTHERIDÆ).

Certain extinct animals living in the Eocene times, included by Cuvier in his division of the Pachyderms, and closely allied to the Hogs and Hippopotami, constitute the family of Anoplotheres. They were first revealed by the genius of Cuvier from the study of the remains discovered in the gypsum quarries at Montmartre; and they owe their name and their most distinguishing character to the fact that their teeth, which in all number forty-four, form an even, unbroken series, like those in man, the canines not standing out sharp and prominent above the rest, as in the case of the Carnivores and the Palæotheres found in association with them. These animals presented remarkable variations in size, some being as large as a Pony, while others were about the size of a Gazelle. They varied also in their proportions, some being heavily built, as in the restoration given above, while others were slender and elegant like the Antelopes. They are of peculiar interest, because they are the parent stock from which in succeeding geological ages the Ruminants are derived.

W. Boyd Dawkins.
H. W. Oakley.

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